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ORIGINAL ARTICLES.

RECENT ADVANCES IN OUR KNOWLEDGE OF THE CHEMICAL PROCESSES OF DIGESTION.[1]

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THE development of the modern physiology of digestion is almost coincident with the lifetime of our immediate predecessors. It is true that the doctrines of the older writers, the theories of concoction, putrefaction, trituration, fermentation and maceration, early yielded to the criticism and experimental deductions of Spallanzani, who, before the close of the eighteenth century, gave a firm footing to the chemical theories of to-day. But the really modern formulation of the significance of the digestive changes in the alimentary tract dates from the classic work of Tiedemann and Gmelin[2] published in 1826.

In attempting to appreciate the status of this branch of physiology at that period it is instructive to recall the prize problem announced by the French Academy in 1823. After reference to the inexact and superficial notions prevalent at that time with regard to the phenomena involved in the digestive work of the stomach and intestine, and in recognition of the advances then made in the more accurate analysis of animal and vegetable substances, the following subject was proposed for investigation, namely: "A determination, by a series of chemical and physiological experiments, of the phenomena which occur in the digestive organs during the act of digestion." The competitors were directed to investigate first the chemical or other modifications which the proximate organic principles undergo in the digestive organs, preference being given to those substances, such as gelatin, albumin, sugar, etc., which enter into the composition of the food. Investigation was next to be directed to the aliment itself, with due regard to distinctions between liquid and solid food; and, finally, the experiments were to be extended through "the four classes of vertebrate animals."

The problem presented by this learned body is as comprehensive as the field of digestion; and it involves many questions which still await their final solution. But the mere statement serves to illustrate how rudimentary and inadequate the conception of digestion must have been in the minds of the French scientists who proposed a subject which was well adapted to tax the ability and resources of a host of later investigators.

For several reasons it seems to me not inappropriate to refer to these facts of purely historical interest on this occasion. In an era of great progress and splendid achievements in many branches of medicine, and during a period when new aspects of science are created and developed within a single decade, when the world marvels at the revelations of modern bacteriology, and the possibilities of preventive medicine have revolutionized the modes of living, the members of this Association are liable to forget the enormous strides which that branch of physiology in which their own interests so largely center has made during three-quarters of a century. In the rapid bounds with which the study of digestion is advancing lies the justification for an attempt to present some of the more recent contributions which physiological chemistry has afforded.

From whatever standpoint the chemical processes are reviewed, the enzymes, or soluble ferments, demand the most important place among the active agents involved. The question as to their exact chemical nature is still unsolved; but with the increasing attempts to interpret physiological reactions in the light of the modern physical chemistry instead of the more obscure "vitalistic" conceptions there is a growing tendency to regard enzymes as special types of catalytic agents, colloidal in nature, which are subject to the general laws applicable to the inorganic catalyzers. For the present, however, we are scarcely justified in going further than to direct attention to the marked correspondence between catalysis and enzyme action in respect to the laws of velocity of reaction, optimum temperature and dependence upon external influences. The so-called reversible action of enzymes deserves special notice, since it throws new light upon the synthetic processes in the organism. An enzyme solution, for example, which is able to bring about a partial hydrolysis of fats can, under appropriate conditions, rebuild these fats from their cleavage products.[3] Similar reversions have been obtained with sugar-splitting enzymes. If proteolytic enzymes are found to demonstrate a reversible action and thus to be able to resynthesize proteids from the products of proteolysis, an important addition to our knowledge of anabolism will have been made.[4] It remains to be seen whether all enzymes exhibit reversible actions, before any wide-reaching conclusions can be formulated. We may nevertheless recognize in these observations a step toward a possible explanation of the building-up or assimilative activities in the body.

1 Read before the American Gastro-enterological Association, New York, April 24, 1905.

2 Tiedemann and Gmelin: Die Verdauung nach Versuchen, Heidelberg, 1826.

3 Cf. Kastle and Loevenhart: American Chemical Journal, 1901, 24, 491; Hanriot: Comptes rendus, 132.

4 Cf. Herzog: Zeitschrift für Physiologische Chemie, 1903, 39, 305.

The researches of recent years have taught us that enzymes cooperate in the alimentary digestive processes under conditions which have heretofore not been appreciated, and we have learned to recognize the existence of entirely new types of soluble ferments. It is a current impression that fats are not attacked in the stomach and that the gastric juice is not endowed with lipolytic properties. Although experiments reported years ago from Ludwig's laboratory indicated the possibility of the cleavage of fats in that organ, the results were generally attributed to bacterial action. Vaughan Harley and others found both free fatty acids and soaps in the stomach of the dog after ingestion of milk; and they attributed to the stomach the power to liberate fatty acids from neutral fats, thus explaining in part the relatively slight effect of the removal of the pancreas, with the attendant loss of its fat-splitting enzyme, on the digestion of fats under such experimental conditions. But it is owing to the observations of Volhard,[4] in Riegel's clinic, on human gastric juice that interest has again been aroused with respect to the gastric digestion of fats. He has shown that in emulsions of fat prepared from yolk of egg, cream and various oils, fatty acids are readily liberated by glycerin extracts of the mucosa as well as by the expressed gastric juice. The enzyme itself is very sensitive toward pepsin, hydrochloric acid and heat, and its effective action seems to be conditioned largely by the perfection of the emulsion of the fat. Moreover there is, further, some evidence of the existence of a zymogen of the stomach lipase (or steapsin).

In this connection mention may be made of a peculiar observation which has very lately been reported from Pawlow's laboratory in St. Petersburg by Dr. Boldireff.[5] In dogs with gastric fistulæ he has noted a regurgitation of a mixture of bile, intestinal and pancreatic juices into the stomach under the following conditions, namely: during prolonged hunger; after feeding with various types of fat foods; and with excess of acids in the stomach. Since it is known that fatty foods inhibit markedly the motor and secretory functions of the stomach, this investigator concludes that the digestion of such ingesta in the stomach may be dependent largely upon pancreatic juice which enters in the manner recited. If these observations receive experimental verifications in man, our conceptions regarding the chemical factors in gastric digestion may require modification. In consideration of the great number of examinations of the gastric contents constantly made by clinical observers in all parts of the world it seems unlikely, however, that the occurrence in the human stomach of conditions comparable with those described by Boldireff would have escaped notice.

A further contribution to our knowledge of the digestion of fats is found in Boldireff's[6] discovery of an active fat-splitting enzyme in the intestinal secretion of dogs. If this shall be found to be of universal occurrence in the higher animals, it will, in conjunction with the newly noted observations on fat cleavage in the stomach, serve to explain the relatively good utilization of the fats of milk observed under conditions in which the cooperative action of the pancreatic juice is excluded.

More extensive are the additions lately made to the literature of the proteolytic enzymes. Cohnheim's[7] discovery of *erepsin* deserves detailed mention. This soluble ferment furnished by the small intestine is capable of further splitting the primary cleavage products of proteids,—albumoses and peptones,—into the crystalline nitrogenous derivatives. It does not act on the native proteids (with the exception of casein); and in this respect it differs from trypsin. Though abundant in the mucosa, erepsin is present in the intestinal secretion in small quantity only; and according to Cohnheim its action is presumably exerted upon the products of proteolysis in their slow passage through the epithelial cells during absorption. The occurrence of erepsin in the intestine has repeatedly been confirmed even in man; and Vernon[8] reports that it is present in all animal tissues, and that the various tissue erepsins are to some extent specific. It is perhaps too early to fortell the significance of erepsin for the intestinal digestion of proteids. Experimental data collected by E. Zunz[9] on dogs with ligated pancreatic ducts indicate that it may become a valuable adjunct to trypsin. The lack of pancreatic juice may be more or less completely compensated by a more vigorous intervention of the gastric enzymes on the one hand, and of erepsin on the other.

From what has been said it is evident that suitable provision is made in the alimentary canal for a more complete breaking down of the foodstuffs than was formerly assumed. An increasing acquaintance with new cleavage products of the proteids has led to the finding of these relatively simple compounds at various times among the gastro-intestinal contents. This is, at least, true for the small intestine, the large intestine apparently retaining the function of an organ of absorption as has long been assumed.[10] Beyond the intestinal wall, in the blood and lymph stream, the cleavage products seem for the most part to be missing; and we must ask ourselves whether an extensive disintegration of the complex proteid foodstuffs actually takes place during life, and if so, what is the fate of the fragments formed. The ultimate digestion products do not accumulate in the intestinal walls; and in view

4 The literature is reviewed by Stade: Hofmeister's Beiträge zur chemischen Physiologie, 1903, 3, 292; see also Kastle and Loevenhart: American Chemical Journal, 1901, 24, 491.

5 Boldireff: Zentralblatt für Physiologie, 1904, 18, 475.

6 Boldireff: Zentralblatt für Physiologie, 1904, 18, 460.

7 Cohnheim: Zeitschrift für physiologische Chemie, 1901, 33, 451; 1902, 35, 134; 1902, 36, 13.

8 Vernon: Journal of Physiology, 32, 30.

9 Zunz: Mémoires de l'academie royale de médecine de Belgique, 1904; cf. also Weekers: Archives internationales de physiologie, 1905, 2, 49.

10 Cf. Glaessner: Zeitschrift für klinische Medizin, 1904, 52, 361.

of recent observations of von Bergmann and Langstein[11] it is possible that the failure to discover them in the blood is due to the fact that their disposition and assimilation in the tissues keeps pace with absorption from the intestine. I have said elsewhere that there is something attractive in the theory which assumes a more complete breakdown of the foodstuffs prior to their assimilation into living tissue or circulating blood constituents. It is not difficult to conceive how the organism can construct from these fragments the tissues peculiar to itself and accordingly maintain its chemical integrity, although the ingesta may vary widely in composition—in other words, how foreign flesh- and cereal- and milk-proteids may all give rise to the same serum albumin or muscle globulin. We may look for more definite knowledge on this subject in the near future; it is a fundamental problem in physiology.[12]

It is impossible in this short paper to refer to all the agents which act upon the foodstuffs. That the intestinal juice contains enzymes capable of inverting disaccharides like cane sugar and maltose has received repeated verification in man. Some inversion may even go on in the stomach.[13] The importance of the bile as a solvent for fatty acids and soaps formed in the digestion of fats is now generally admitted, and there is a growing tendency to question the possibility of fat absorption without the intervention of digestive changes. Although the occurrence of a proteolytic enzyme in the bile of man has been reported at various times,[14] the newer animal experiments of Rosenberg[15] confirm the older observations of Voit and Röhmann in denying any important significance to this secretion in the digestion and utilization of proteids.

Two newer features of the chemical physiology of enzymes deserve mention, namely, the question of the specificity of the soluble ferments and the existence of anti-enzymes. In studying the nature of the resistance which intestinal parasites offer to the digestive juice in which they are bathed, Weinland[16] has come to the conclusion that they elaborate specific substances which can inhibit the action of pepsin and trypsin,—anti-enzymes, precipitable, thermolabile, and resembling familiar antibodies in various respects. In extending these observations to a consideration of the resistance which the stomach and intestine offer to the digestive power of the juices contained within them, Weinland[18] further found that extracts of these organs, like extracts of intestinal parasites, check the proteolytic power of pepsin and trypsin in artificial digestion trials. We are thus brought to the recognition of a new factor in the immunity of the body against its own secretions, and its possible bearings on the pathology of the alimentary canal can only be surmised at present. To what extent, for example, is the development of certain types of gastric ulcer (Ulcer rot. ventric.) associated with absence or insufficient content of antipepsin in the gastric cells?

The foregoing observations on anti-enzymes have led to a widespread interest in their phenomena. New illustrations continue to be reported from time to time, and strengthen the probability that we are dealing here with a protective response of peculiar significance. Thus the antitryptic action of blood serum has been pointed out by various investigators,[19] and in conformity with the experience gained in the modern study of toxins, specific anti-enzymes have been developed in animals—an anti-amylase for the blood amylase,[20] antirennin, anti-antirennin[21] and antikinase[22] serving as illustrations. The suggestions involved are too new and incomplete to receive a hasty acceptance; they serve, however, to illustrate a recent tendency in the experimental study of the problems of digestion. Still more inconclusive are the recent attempts to demonstrate a far reaching specificity in the enzymes with which the foodstuffs are brought into contact. Vernon[23] and Pollak[24] have argued for a series of trypsins and erepsins; Ascoli and Bonfanti[25] postulate the existence of a multiplicity of amylolytic enzymes exhibiting noticeable preferences for specific starches. It is evident that these investigators have been influenced by the pluralistic theory of antibodies advocated so vigorously by Ehrlich.

Since the enzymes which have been discussed are the products of the digestive glands we may appropriately pause to consider briefly the development of our ideas of secretion. The purely mechanical conception of physiological processes was exemplified typically in the writings of Ludwig. Physical forces are called into play wherever possible, and filtration and diffusion assumed to explain the essential features of secretion. Ludwig and Claude Bernard in particular emphasized the important rôle of the nervous elements and vascular supply of the secretory glands; to Heidenhain we owe the more comprehensive consideration of an additional factor,—the living cell,—as the intermediator in a large number of physiological changes. He demonstrated the morphological changes which the glands undergo during activity and made it impossible longer to conceive of the secreting structure as simple diffusion membranes. His classic monograph on secretion

11 von Bergmann and Langstein: Hofmeister's Beiträge zur chemischen Physiologie, 1904, 4, 30; cf. also Folin: American Journal of Physiology, 1905, 13, 126.

12 For a recent discussion of the subject see Abderhalden: Zeitschrift für physiologische Chemie, 1905, 44, 17; Folin: American Journal of Physiology, 1905, 13, 126.

13 Cf. Ferris and Lusk: American Journal of Physiology, 1898, 1, 277; Lusk: ibidem, 1903, 10, xxi; Widdicombe: Journal of Physiology, 1902, 28, 173.

14 Cf. Tschermak: Zentralblatt für Physiologie, 1902, 16, 330.

15 Rosenberg: Engelmann's Archiv für Physiologie, 1901, 528.

16 Weinland: Zeitschrift für Biologie, 1903, 44, 1.

18 Weinland: ibidem, page 45.

19 For the literature see Oppenheimer and Aron: Hofmeister's Beiträge zur chemischen Physiologie, 1903, 4, 279.

20 Cf. Ascoli and Bonfanti: Zeitschrift für physiologische Chemie, 1904, 43, 156.

21 Cf. Korschun: ibidem, 1903, 36, 141.

22 Cf. Dastre and Stassano: Archives internationales de physiologie, 1904, 1, 86.

23 Vernon: Journal of Physiology, 29 et seq.

24 Pollak: Hofmeister's Beiträge zur chemischen Physiologie, 1904, 6, 95.

25 Ascoli and Bonfanti: Zeitschrift für physiologische Chemie, 1904, 43, 156.

marked a new era in the history of this subject. It established the significance of cellular activity in the work of glands, without, however, furnishing an adequate explanation of the forces which the living cell employs. Heidenhain wrote in 1883: "Je mehr sich unsere Kenntnis vertieft hat, desto klarer und zweifeloser ist es geworden, dass in den verschiedenen Absonderungsorganen die wirksamen Apparate ausserordentliche Verschiedenheiten darbieten, so dass wenigstens vorläufig die gemeinschaftlichen Merkmale viel zu allgemeiner Natur sind, um eine allgemeine Theorie der Absonderungsvorgänge zu ermöglichen."[26] The direction of progress in the succeeding twenty years is well indicated by Hofmeister in a recent lecture on the chemical organization of the cell. "Schon heute," he writes, "darf man sagen, dass die Betrachtung der Zelle als eine mit chemischen und physikalisch-chemischen Mitteln arbeitende Maschine nirgends zu Probleme führt welche die Annahme anderer als bekannte Kräfte unvermeidlich erscheinen liessen, und dass, soweit abzusehen, hier für jene Resignation, die sich einmal in einem 'Ignorabimus,' das andere Mal in vitalistischen Schlussfolgerungen äussert, kein Anlass vorliegt."[27]

The most important contribution of the last decade to the physiology of digestion lies in the newer conception of the mechanism and chemical regulation of secretion, and the correlation of the various organs engaged in this part of nutriton. The activity of the salivary glands is excited reflexly according to the nature of the food present in the mouth. The mucous membranes are not indifferent to the composition of the ingested substances and they seem to act as if endowed with discriminating sensibilities for the different foodstuffs. In the case of the gastric juice the evolution of our ideas of its secretion has been singularly progressive. Tiedemann and Gmelin, Beaumont, Bidder and Schmidt, Kühne and even Heidenhain believed to a greater or lesser extent in the possibility of mechanical stimulation of the gastric mucosa. Despite an occasional protest that true gastric juice cannot be obtained by mere contact of inert substances with the stomach membrane, it remained for Pawlow[28] and his coworkers to demonstrate that mechanical irritation either with a rod or feather or spray of sand will evoke the flow of nothing more than an occasional discharge of alkaline mucus. We have been taught from the experiments of the St. Petersburg school to look upon gastric secretion as dependent upon nervous control in which the most important reflex impulses arise in the mouth. According to Pawlow it is not the mechanical act of chewing the food nor even to any extent the chemical make-up of the ingesta which primarily induces the flow of gastric juice, but rather the psychical factor. "Appetit ist Saft!" When once the gastric secretion has been inaugurated by the psychic moment, other stimuli intervene to continue the flow; they are, however, conditioned by the chemical make-up of the food and not by the mere mechanical irritation which their presence in the stomach provokes.

An opportunity has lately been afforded to test in man the conclusions drawn by Pawlow from experiments on dogs. Dr. Hornborg,[29] of Helsingfors, has made a careful study of the conditions inducing secretion in a five-year-old boy in whom a gastric fistula was established because of a complete stricture of the esophagus. The events within the mouth could accordingly only influence the stomach membrane through nervous or circulatory channels. It was observed that the chewing of indifferent substances (like rubber) or of distasteful ones, failed to provoke secretion, whereas the mastication of appetizing foods was followed by a more or less active flow in the empty stomach. A purely psychic secretion, such as Pawlow provoked by exhibition of food, failed to be manifested in the boy. But Hornborg does not regard his trials as conclusive against the psychic theory. Still more recently comparable results on man have been reported by Umber[30] and Bickel.[31]

What are the excitants of pancreatic secretion? It has long been known that the introduction of acid into the duodenum provokes a flow of pancreatic juice. Pawlow supposed that this is due to a nervous reflex. But Popielski and Wertheimer and Lepage demonstrated that the same phenomenon may follow even after exclusion of nervous impulses from without the organ involved; and they in turn attributed the response to a peripheral reflex independent of the control of the central nervous system, but connected with local ganglia. To Bayliss and Starling[32] is due the discovery that we are here dealing with an entirely different and hitherto unrecognized order of phenomena and that the secretion of the pancreas is normally called into play not through extrinsic nervous channels at all, but by a chemical substance which is formed in the mucous membrane of the upper parts of the small intestine under the influence of acid and is carried thence by the blood-stream to the gland cells of the pancreas. The name *secretin* has been given to the substance as not yet completely isolated and identified, which is the specific excitant of the gland. It is obtained by extracting the mucous coat of the intestine with 0.4 per cent. hydrochloric acid. A very small portion of such an extract injected into the circulation suffices to call forth a copious flow of pancreatic juice. The active agent is not the hydrochloric acid, since this alone does not provoke secretion when introduced directly into the blood current. The sub-

26 Heidenhain: Hermann's Handbuch der Physiologie, 5, 4.
27 Hofmeister: Die chemische Organization der Zelle, page 29.
28 Pawlow: The work of the digestive glands.

29 Hornborg: Skandinavisches Archiv für Physiologie, 1904, 15, 209.
30 Umber: Berliner klinische Wochenschrift, 1905, No. 3, 56.
31 Bickel: ibidem, No. 3, 60.
32 An admirable review of the subject is given by Bayliss and Starling in their Croonian Lecture: Proceedings of the Royal Society, 1904, 73, 310. On secretin see the writer's article in the Reference Handbook of the Medical Sciences, edited by A. H. Buck.

stance is not like the ordinary enzymes; its solutions can be boiled and neutralized without undergoing a diminution in activity. Secretin has already been obtained from many animals. It is not specific for the species from which it is prepared; but it is characteristic in origin since it has been impossible to obtain a body resembling secretin from any tissue of the body other than the mucous membrane of the duodenum or jejunum. The action of secretin is not confined to the pancreas; the production of bile is simultaneously stimulated and thus the factors essential for the proper intestinal digestion of the fats in particular are created.

The discovery of secretin marks a noteworthy step in advance in the study of digestion; for it has taught us a new method of chemical regulation of the secretory processes, supplementing or even supplanting the influence of the nervous system. Fleig[33] has lately found that secretin can be developed by contact of soaps, alcohol and other substances with the intestinal mucosa. From his researches it seems as if many of the substances such as alcohol, ether, mustard, chloral, etc., which are known to excite pancreatic secretion may exert a twofold effect, acting in part through the intermediation of the secretin formed—the humoral path—and in part through nervous reflex ways.

We are now more easily enabled to form some synthetic conception of the events which succeed each other in the digestive cycle. The stomach contents with the combined hydrochloric acid and food masses poured into the duodenum through the relaxed pylorus, provoke a flow of pancreatic juice, bile and, according to recent observations of Delezenne and Frouin,[34] of enteric juice. An excessive discharge of acid chyme is prevented by the reflex pyloric mechanism which keeps the sphincter closed so long as the duodenal contents are acid. Meanwhile the discharged acid chyme is becoming neutralized by the flow of alkaline secretions which its very presence has inaugurated. The neutralization is again followed by the removal of pyloric inhibition and a further escape of acid chyme into the gut is permitted. Thus the double mechanism, partly chemical and partly nervous, maintains a correlation of the digestive activities and provides that the gastric contents shall be discharged only in proportion as they can be dealt with by the secretory mechanism of the intestine.

The pancreatic juice, as it is secreted, contains little if any proteolytic enzyme; in its place the zymogen, trypsinogen, is present. To Schepowalnikow,[35] a pupil of Pawlow, is due the distinction of having discovered a remarkable property of the intestinal juice in "activating" trypsinogen; that is, of converting into trypsin the zymogen of the pancreatic juice. This action is due to a peculiar enzyme, enterokinase; and the discovery introduces us to a new class of enzymes, the kinases or zymolysins, capable of activating zymogens. The observations have already been confirmed in man. The pancreatic juice collected by Glaessner[36] directly from a fistula contained no preformed trypsin, but could readily be "activated" by intestinal extracts; and Hamburger and Hekma[37] who had opportunity to collect human intestinal juice, found that it contained enterokinase. The amylolytic and lipolytic enzymes of the pancreas are apparently preformed in the secretions and require no activating agent. As an adjunct to tryptic digestion in the gut the intestinal juice has thus acquired added importance. The possible pathological consequences of an unchecked secretion of both pancreatic and intestinal juices into an empty intestine need only be hinted at. Experimentally, marked erosions have already been produced thereby under appropriate conditions. From another standpoint Popielski[38] has insisted that in disease involving the mucosa of the small intestine where the secretion of an active enteric juice is impossible, the exhibition of food is useless; for it is no longer digested. Under such conditions abstinence from food with simultaneous administration of intestinal sedatives must form the basis for rational treatment.

In addition to these chemical regulations of the secretory processes we have lately learned of the occurrence of remarkable functional adaptations on the part of the digestive glands to the work which they are called upon to accomplish. Maly wrote, in 1881: "The foods which we consume day by day are so varied in respect to odor, color, flavor and composition that it seems as though the processes of digestion are subject to daily change in every individual." Great diversity in the compositon of the digestive secretions of the different animal species was also recognized to exist; but no adequate explanation for these differences was forthcoming so long as the attempt was made to reduce the problem to broad generalizations. Pawlow and his pupils believed that they had discovered a difference in the digestive power of the pancreatic juice corresponding with the digestive demands of the diet used. Their conclusions, though widely quoted, have been called into question seriously by Popielski and Bayliss and Starling. Weinland[39] furnished the first convincing evidence that adaptation of the pancreas does occur. He found that while the pancreas of adult dogs contains no *lactase*—the enzyme capable of splitting up milk-sugar into monosaccharides—the extracts of dogs fed for several days on milk and milk-sugar, invariably contained lactase in considerable amount. When dogs were fed meat with the addition of milk-sugar the pancreas contained lactase, whereas milk-sugar injected subcutaneously for several days was without effect. These facts have been

33 Fleig: Archives internationales de physiologie, 1904, 1, 286.
34 Delezenne and Frouin: Comptes rendus de la société de biologie, 56, 319.
35 Quoted by Pawlow: Das Experiment, etc., Wiesbaden, 1900.
36 Glaessner: Zeitschrift für physiologische Chemie, 1904, 40, 478.
37 Hamburger and Hekma: Journal de physiologie, 1904, 4.
38 Popielski: Centralblatt für Physiologie, 1903, 17, 70.
39 Weinland: Zeitschrift für Biologie, 38, 16, 607; 40, 386.

verified by Bainbridge,[40] and the mechanism of the adaptation investigated. The formation of lactase is a specific reaction to lactose and occurs only when the milk-sugar is given by way of the mouth. The enzyme is formed by the pancreas itself and represents a definite adaptation to a milk diet on the part of that gland. The subcutaneous injection of extracts of the intestinal mucous membrane of a milk-fed dog into a biscuit-fed dog causes the pancreas of the latter to produce lactase; this is the only means, apart from a milk diet, by which the pancreas can be made to manufacture lactase. Extracts of the intestinal mucosa of biscuit-fed dogs are ineffective. This adaptation of the pancreas to milk-sugar is carried out by a chemical mechanism. The sugar acts upon the intestinal mucosa to produce some substance which is carried in the blood-stream to the pancreas and stimulates that organ to form lactase. It is interesting to note in this connection that the pancreas of new-born puppies contains no lactase, although the enzyme makes its appearance in a few days after feeding begins.

With this glance at the mechanism by which a digestive gland is adapted to the nature of the food a host of questions are brought into view. What is the nature of the substance which is formed in the mucous membrane? Are other qualitative adaptations of enzymes carried out in similar fashion? To what extent can the glandular functions be altered by radical changes in diet? We may confidenly await a satisfactory solution of these related problems; at any rate the observations recorded have made clear "the intimate relation which must exist between the chemical activities of very different organs of the body."[41]

Perhaps the most striking feature of the present development of the study of digestion is the increasing complexity with which the explanation of this function is attended. Yet the unraveling of the details of these interrelated chemical and physiological reactions gives promise of a clearer understanding of the ensemble of processes termed digestion. We are rapidly learning to appreciate the significance and mechanism of the specific responses of the digestive glands under a great diversity of conditions. In 1833 Dr. Beaumont wrote in the preface to his observations on Alexis St. Martin: "The reader will perceive some slight seeming discrepancies, which he may find it difficult to reconcile; but he will recollect that the human machine is endowed with a vitality which modifies its movements in different states of the system, and probably produces some diversity of effects from the same causes." In proportion as these "seeming discrepancies" are found to be characteristic responses to definite conditions and are subjected to rigorous experimental analysis, the physiology of digestion is becoming a more exact science.

40 Bainbridge: Journal of Physiology, 1904, 31, 98.
41 See also Fleig: Archives internationales de physiologie, 1904, 1, 341.

LAENNEC AND HIS STETHOSCOPE.[1]

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OF NEW YORK.

I AM very glad of this opportunity to meet the members of the Students' Club. I am a firm believer in these undergraduate medical organizations and sincerely hope the time will come, when the length of the medical course shall be such, and the work so ordered that it will be possible for American undergraduates to take up special bits of work in our laboratories, and publish their results.

This is not uncommon abroad and every year we are hearing more and more of instances of good scientific contributions from American undergraduates.

I selected Laennec to speak to you of, not only because he is famous as the inventor of that instrument, the stethoscope, upon which we rely so largely, but also because he himself was an active scientific undergraduate observer and publisher. While a student and but twenty-one years of age he published the results of careful investigations of a case of heart disease, and a series of cases of peritonitis, and even conducted a course of lectures on pathological anatomy. Then too, Laennec stands as the greatest example of an accurate observer and faithful recorder of his observations.

Réné Théophile Hyacinthe Laennec, as was his full name, was born at Quimper in Lower Brittany, February 17, 1781. His first medical influence was from his uncle, Doctor Laennec, of Nantes. After finishing his preliminary education he became the pupil in medicine under this uncle, who was Professor of Medicine and Materia Medica at Nantes. These were all the stirring years of the Revolution in France, and young Laennec found an opportunity to occupy himself in the military hospitals established at Nantes. At nineteen years of age he went to Paris to complete his medical education at the Clinical School of the Great Charity Hospital (La Charité) then under the direction of the celebrated Corvisart. During the first three years of his attendance as pupil at La Charité he drew up a minute history of nearly 400 cases of diseases. It was from these carefully taken student notes that the reports already alluded to were published, and from these too according to the authority of Laennec's cousin, Dr. Meriadec Laennec, quoted by Forbes, that the ground work of all his future researches and discoveries was constructed.

On June 11, 1804, he received his degree of Doctor of Medicine. From his student days up to the time of his early death, he was always delicate; not merely of frail constitution, but often actually incapacitated for carrying out the ambitions of his indomitable energy, and he must be grouped with the long list of men who struggled through illness and achieved success. Among

1 Address to the Students' Club of the Cornell University Medical School.

these are Lancisi and Corvisart, both sufferers from heart disease, Darwin and Huxley, John Hunter, Matthew Arnold, Mr. Sumner, the last three suffered from angina pectoris; and Max Muller and many others, who struggled silently, and of whose sufferings history knows nothing.

The early years after his graduation he spent in the dissecting room and morgue, familiarizing himself with those conditions which he studied clinically. At this time the great method for examining the chest was that of percussion divised by Auenbrugger. Auscultation was at that time not thought of. It was the desire for more complete clinical methods of investigation which led

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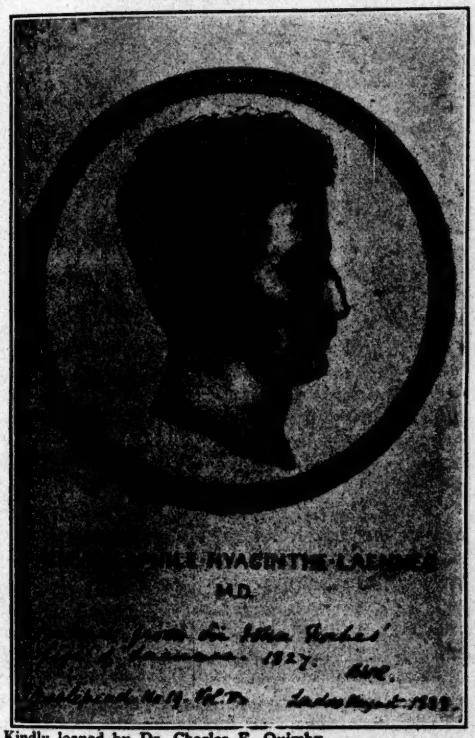

Kindly loaned by Dr. Charles E. Quimby.

Laennec to *listen* over the chest. Let me read to you his own description of how he came to devise his methods of auscultating the chest.

. . . "The diseases of the thoracic viscera are very numerous and diversified, and yet have almost all the same class of symptoms. Of these the most common and prominent are cough, dyspnea, and, in some, expectoration. These, of course, vary in different diseases; but their variations are by no means of that determinate kind which can enable us to consider them as certain indications of known variations in the diseases. The consequence is, that the most skilful physician who trusts to the pulse and general symptoms, is often deceived in regard to the most common and best known complaints of this cavity. Nay, I will go so far as to assert, and without fear of contradiction from those who have been long accustomed to morbid dissections that, before the discovery of Auenbrugger, one-half of the acute cases of peripneumony and pleurisy, and almost all the chronic pleurisies, were mistaken by practitioners; and that, in such instances as the superior tact of a physician enabled him to suspect the true nature of the disease his conviction was rarely sufficiently strong to prompt and justify the application of very powerful remedies. The percussion of the chest, according to the method of Auenbrugger, is one of the most valuable discoveries ever made in medicine. By means of it, several diseases, which had hitherto been cognizable by general and equivocal signs only, are brought within the immediate sphere of our perceptions, and their diagnosis, consequently, rendered both easy and certain.

"We must still admit, however, that the method of percussion is far from being complete or generally available. It frequently affords no indication in phthisis; and in no case does it enable us to distinguish this disease from chronic peripneumony. Even in peripneumony it fails us in a great measure when the inflammation is confined to the center of the lung, or when both lungs are equally affected, and only in a slight degree. It does not enable us to distinguish the disease just mentioned from pleurisy, hydrothorax, or any other effusion into the cavity of the chest. It completely fails us, or rather misleads us, in the disease called *pneumothorax*. It gives no indication of the diseases of the heart until this organ is greatly enlarged; and it is often before this takes place that the disease proves fatal. It affords no assistance in aneurisms of the aorta and large vessels, until the nature of the disease is appreciable by the sight, or by the touch. In many other respects, also, the indications afforded by percussion are rendered equivocal by peculiarities of formation, by the niceties required in its performance and the circumstances under which it is performed. It is more particularly in diseases of the heart that we regret the insufficiency of this method, and wish for something more precise. The general symptoms of disease in this organ greatly resemble those produced by many nervous complaints, and by the disease of other organs. The results afforded by application of the hand to the part, with the view of judging from the tactual sensation communicated, have been found of some use, in doubtful cases; but, as a general method this is by far too vague and uncertain to be of much benefit.

"In these cases some physicians have attempted to gain further information by the application of the ear to the precordial region; and, doubtless, such a proceeding will increase the certainty of the diagnosis. Even this, however, is very insufficient; and there are, besides, many reasons why it cannot be followed as a general guide in practice. Nevertheless, I had been in the

habit of using this method for a long time, in obscure cases, and where it was practicable; and it was the employment of it which led me to the discovery of one much better."—*John Forbes' translation, pp. 209, 210. First American Edition. James Webster, 1823.*

In 1816 Laennec was appointed chief physician to the Necker Hospital, where he had ample opportunity of testing and corroborating the accuracy of his method. So closely did he apply himself to his work that he broke down and was compelled to retire to his country house near Quimper. He had at this time only communicated his discovery to societies, and it was not until 1819 that the long delayed publication in book form of his methods was accomplished.

This title page appeared in the first edition:

Auscultation Mediate
ou
Traité du Diagnostic des Maladies
des Poumons et du Cœur,
Fonde Principalement sur ce nouveau
Moyen D'Eploration.
Par R. T. H. Laennec,
D. M. P., Médecin de l'Hôpital Necker, Médecin
honoraire des Dispensaires, Membre de la
Société de la Faculté Médecin de
Paris et de plusieurs autres
nationales et étrangères.
Μέγα δὲ ἡγεῦμαι τῆς τέχνης εἶναι τὸ δύνασθαι σκοπεῖν.
Pouroir explorer est, à mon avis, une
grande partie de l'art.—Hipp. Epid. III.
Paris—J. A. Brosson et J. S. Chaude, Libraires,
rue Pierre-Sarrazin, No. 9.
1819.

It is from this publication that I have just quoted, and I will go on from the same source to read you his own description of the stethoscope.

. . . "In 1816, I was consulted by a young woman laboring under general symptoms of heart disease, in whose case percussion and the application of the hand were of little avail, on account of the great degree of fatness. The other method just mentioned being rendered inadmissible by the age and sex of the patient, I happened to recollect a simple and well-known fact in acoustics, and fancied, at the same time, that it might be turned to some use on the present occasion. The fact I alluded to is the augmented impression of sound when conveyed through certain solid bodies, as when we hear the scratch of a pin at one end of a piece of wood, on applying our ear to the other. Immediately, on this suggestion, I rolled a quire of paper into a sort of cylinder and applied one end of it to the region of the heart and the other to my ear, and was not a little surprised and pleased to find that I would thereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of the ear. From this moment I imagined that the circumstance might furnish means for enabling us to ascertain the character, not only of the action of the heart, but of every species of sound produced by the motion of all the thoracic viscera. With this conviction, I forthwith commenced at the Hospital Necker a series of observations, which has been continued to the present time. The result has been, that I have been enabled to discover a set of new signs of diseases of the chest, for the most part certain, simple and prominent, and calculated, perhaps, to render the diagnosis of the diseases of the lungs, heart and pleura, as decided and circumstantial, as the indications furnished to the surgeon by the introduction of the finger or sound, in the complaint wherein these are used.

"In prosecuting my inquiries I made trial of instruments of various composition and construction. The general result has been that bodies of

No. 2.

Laennec making a ward visit in the Necker Hospital, Paris, 1816. The Stethoscope may be seen in his left hand. (From a painting in La Sorbonne, and reproduced in *Harper's Monthly Magazine*, 1899.)

a moderate density, such as paper, wood or Indian cane, are best suited for the conveyance of the sound, and consequently for my purpose. This result is perhaps contrary to a law of physics—it has, nevertheless, appeared to me one which is invariable.

"I shall now describe the instrument which I use at present, and which has appeared to me preferable to all others. It consists simply of a cylinder of wood, perforated in its center longitudinally by a bore three lines in diameter, and formed so as to come apart in the middle, for the benefit of being more easily carried. One extremity of the cylinder is hollowed out into the

form of a funnel to the depth of an inch and a half, which cavity can be obliterated at pleasure by a piece of wood so constructed as to fit it exactly, with the exception of the central bore which is continued through it, so as to render the instrument, in all cases, a pervious tube. The complete instrument—that is, with the funnel-shaped plug infixed—is used in exploring the signs obtained through the medium of the voice and the action of the heart; the other modification, or with the stopper removed, is for examining the sounds communicated by respiration.

"This instrument I commonly designate simply the cylinder, sometimes the stethoscope." στῆθος, chest; σκοπεῖν, to examine.

On November 15, 1818, he returned from his retreat in lower Brittany to resume his duties at the Necker Hospital. In 1822 he was appointed to the Chair of Medicine in the College of France, and made Professor of Clinical Medicine at the Charity Hospital. In 1826 he brought out a second edition of his work on Auscultation. This entailed an immense amount of very hard work and he again broke down. He was compelled to give up. The dry cough from which he had long suffered became more severe and was accompanied by pains in his right side, fever, dyspnea, diarrhea and great emaciation. He repaired again to his birthplace. There was a temporary improvement in his condition followed by a return, with greater severity, of all the bad symptoms. On August 13, 1826, he died from (as you have already guessed) pulmonary tuberculosis, in the forty-fifth year of his age.

As we look over his writings we are impressed with the clear and thorough descriptions. We are impressed moreover, with the number of terms first employed by him, which we familiarly use to-day. Some of these are the following: Auscultation, râles and the varieties of these, mucous (muquex), liquid (humides), sonorous (sonoré), crepitant (crepitant), fremitus (fremissment), pectoriloquy (pectoriloque), metallic tinkle (tintement metalique), egophony (l'egophonie), bronchophony (bronchophonie), peurile breathing, stethoscope.

As an example of his clear descriptions, which have not been improved upon up to the present day, let me read you the following:

(P. 215): . . . "On making use of the cylinder with the view of further investigating, I soon found, as indeed might have been expected, that it conveyed the peculiar vibration much less distinctly than the bare hand. I also ascertained that the degree of intensity of the vibration varied in different points of the thorax. The places where it is most distinct are the axilla, the back—between the spine and the edge of the scapula, and on the anterior and superior part of the chest near the angle formed by the union of the clavicle with the sternum. When we apply the cylinder to these points, the voice appears stronger and nearer to us; in the others on the contrary, par-

No. 3.

DESCRIPTION OF PLATE I.

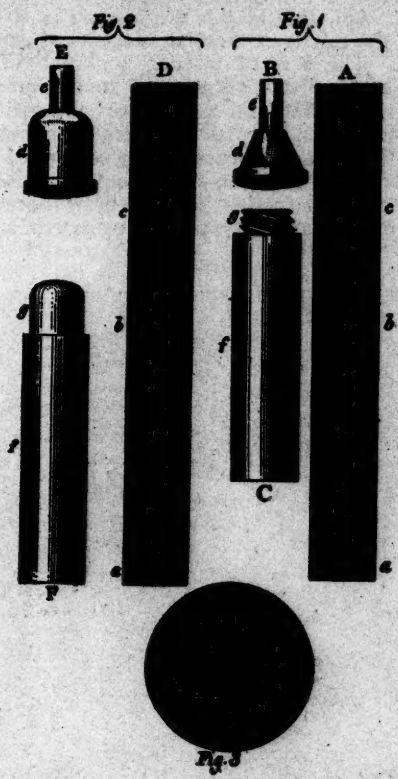

Fig. 1 (A. B. C.).—The stethoscope as delineated in the first edition of Laennec's treatise, published in 1819.

A.—Longitudinal section of the stethoscope reduced to one-third its actual dimensions.

a. The plug or stopper in its place. *b.* The point of union of the two parts. *c.* The upper or auricular half.

B.—The plug or stopper removed. *d.* The body of it formed of the same wood as the rest of the instrument. *e.* Small brass tube traversing the stopper for fixing it in the tube of the stethoscope.

C.—The upper portion of the stethoscope. *f.* The body of it. *g.* Screw, cut in the wood, for uniting the two parts together.

Fig. 2 (D. E. F.).—The stethoscope, as altered by Laennec, and delineated in the second edition, published, in 1826.

D.—Longitudinal section of all the parts united, one-third of the actual dimensions. *a.* Stopper in place *b.* Point of junction of the two parts. *c.* Upper or auricular half.

E.—The stopper removed. *d.* Its body, made of the same wood. *e.* Brass tube for fixing it into the base of the stethoscope.

F.—Pectoral or lower half of the stethoscope. *f.* Its body. *g.* Its upper extremity reduced so as to fit the cavity in the other half; directed to be covered with thread or leather, in order to make it fit accurately.

Fig. 3.—Actual diameter of the stethoscope (both varieties). *a.* Diameter of the bore.

ticularly in the inferior and posterior parts of the thorax, it seems weaker and more remote."

. (P. 214): . . . "To judge correctly of the state of respiration by this method, we must not rely on the results of the first moments of examination. The sort of buzzing sensation often caused by the first application of the instrument, the fear, restraint, and agitation of the patient, which mechanically lessen the force of the respiration, the frequently inconvenient posture of the observer, and the great sensation occasionally produced by the action of the heart,—are all causes which may at first prevent us correctly appreciating, or even from hearing at all, the sound or respiration and expiration. We must, therefore, allow some seconds to pass before we attempt to form an opinion."

No. 4.

Statue in Quimper, Lower Brittany, France, Birthplace of Laennec.

(P. 216): . . . Some few individuals, again, preserve through life a state of respiration resembling that of children, and which I shall, therefore, denominate *puerile*, in whatever age it may be perceptible."

Another important characteristic of Laennec, which cannot be stated too emphatically, was that in arriving at his diagnosis he was not satisfied with the *name* of some disease which might best fit the condition before him, but he untiringly investigated his patient to obtain evidence of the pathological changes going on within. This brings out another important fact that Laennec brought his pathological knowledge to bear upon his clinical observations, and indeed his writings show a close interweaving of morbid anatomy and clinical signs.

No small part of his vast information was due to his methods of taking records in his hospital observations. I have Dr. W. S. Thayer as authority for the following quotation of the methods employed by the immortal Laennec in his hospital observations.

"When a patient enters the hospital it is the duty of the pupil to collect from him those facts which he can give concerning his disease, and to follow their course. On examining the patient myself, I dictate the principal symptoms which I observe, those especially which may serve to establish the diagnosis or indications for treatment. And I confirm my conclusion, unless I may have to change it, by subsequent observations. This dictation, which is made in Latin, for the reasons easily appreciated, is taken down by the pupil in charge of the patient, and at the same time on a separate sheet which I call the 'diagnostic leaf,' to keep which, in order that it may be shown to me and read whenever required at each visit, is the especial duty of another pupil. If a new sign appear, such as might modify the first diagnosis, I have that also added. If a patient die, the account of the autopsy is collected by the pupil in charge of the case. I read this account before all those who have been present at the autopsy, and if any correction is to be made, make it on the spot."

In the town of his birth, Quimper, in Lower Brittany, is erected a statue, a photograph of which is here reproduced. The statue is a worthy tribute by the people of this little village to the memory of their distinguished medical townsman.

Conclusion.—I have, I fear, already overstepped my time, but what I hope to have done is to have called your attention to this keen, scientific and withal, kindly physician, who never employed the quack's tools. The temptation is great to believe, as Southey puts it, that "Man is a dupable animal. Quacks in medicine, quacks in religion and quacks in politics know this and act upon that knowledge. There is scarcely anyone who may not, like a trout, be taken by tickling." Laennec's life and success show that a greater fame awaits the *honest* physician.

We must think of him as a great diagnostician looking upon the body with its complex mechanism as something to be thoroughly studied and not promiscuously drugged and guessed about, as so many of his predecessors had done, and also something to be dealt with humanely and gently.

He was then an accurate diagnostician and considerate physician, believing as we must all learn sooner or later that—

Of all the ills that suffering man endures,
The largest fraction liberal Nature cures;
Of those remaining 'tis the smallest part
Yields to the efforts of judicious Art;
But simple *kindness*, kneeling by the bed
To shift the pillow for the sick man's head,
Give the fresh draught to cool the lips that burn,
Fan the hot brow, the weary frame to turn,—
Kindness, untutored by our grave M.D.s
But Nature's graduate, when she schools to please,
Wins back more sufferers with her voice and smile
Than all the trumpery in the druggist's pile.

And last, not least, in each perplexing case,
Learn the sweet magic of a *cheerful face;*
Not always smiling, but at least serene,
When grief and anguish cloud the anxious scene.
Each look, each movement, every word and tone
Should tell your patient you are all his own;
Not the mere artist, purchased to attend,
But the warm, ready, self-forgetting friend
Whose genial visit in itself combines
The best of cordials, tonics, anodynes.

The Morning Visit.—OLIVER WENDELL HOLMES.

RECENT ADVANCES IN THE KNOWLEDGE OF THE MOVEMENTS AND INNERVATION OF THE ALIMENTARY CANAL.*

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THE mechanical factors in digestion perform three chief functions, the movement of the food through the alimentary canal, the mixture of the food with the digestive juices, and the exposure of the food to the absorbing mucous membrane. The progressive peristaltic wave is the most general activity by which these functions are effected. But the progression of the food through the canal is not uniform. Where digestive juices are lacking and absorption does not occur, as in the esophagus, the food is moved rapidly. On the other hand, where digestion and absorption can take place, rapid progression is prevented by sphincters; and the recurring peristaltic waves passing over the food toward closed sphincters serve to mix the food with the digestive juices, as in the stomach, or expose the food to the absorbing mucosa, as in the ascending colon. In the long course of the small intestine, with no sphincters present to oppose peristalsis, peristaltic activity is infrequent, and the mixing and exposing functions are carried on by a special method,—the rhythmic contraction of the circular fibers. These rapidly repeated contractions knead the intestinal contents, without causing any considerable progression.

From the foregoing general considerations it is evident that different portions of the alimentary canal are characterized by particular adaptations of the general method of forwarding, mixing and exposing the food. In this paper the mechanical activities of the different portions of the canal—esophagus, stomach, small intestine, and large intestine, with the sphincters—will be separately treated. As my time is limited I am compelled to neglect details and describe only the more important new accessions to our knowledge.

THE MOVEMENTS OF THE ALIMENTARY CANAL.

The Esophagus.—As the word implies, the esophagus is merely a food carrier, serving to transmit nutriment rapidly from one digestive region to another. The name of your pesident (Dr. Meltzer) is associated with the first demonstration that the swallowed material may be forced through the esophagus by a pressure in the mouth so great that the esophagus acts not to carry but to direct the discharge from the pharynx.[1] From these and subsequent observations[2] the conclusion was drawn that a fluid or semisolid morsel is thrown down the entire length of the esophagus by the contraction of the mylohyoid muscles, and that the activity of the esophagus is merely supplementary, to gather the particles left along the way, or to push down an occasional dry bolus. The possible influence of the method—a tube in the esophagus—in producing the results secured by Kronecker and Meltzer led to the repetition of the observations on man and lower animals in the Harvard Physiological Laboratory.[3] The observations were made by means of the Roentgen rays, and the movement of the food was not affected by the presence of apparatus. The results entirely confirmed those of Kronecker and Meltzer so far as liquids are concerned, but they failed to show any shooting of semisolid food or even thick fluids along the canal. In all the animals investigated (fowl, cat, dog, horse and man) the progression of semisolid and firm particles toward the stomach was accomplished by contraction of the esophagus.

According to Kronecker and Meltzer[2] the human esophagus may be divided into three parts; a cervical part 6 cm. long, a middle part 10 cm. long, and the lowest part about 6 cm. in length. These three parts contract in succession, 1.2, 3, and 6 seconds, respectively, after deglutition begins, but each part, according to Meltzer, contracts as a unit, simultaneously throughout its length. The rate of contraction is different in the different parts. The human esophagus therefore would undergo three successive sectional contractions, not peristaltic in nature.†

Schreiber[4] has studied the contractions of the human esophagus with the method used by Kronecker and Meltzer, and finds no separation of the canal into three parts, each with its own time for contraction. Instead, his curves reveal the existence of a constriction registered gradually later as the recording apparatus is placed gradually deeper in the esophagus. This moving constriction can be explained only as a peristaltic wave. The wave at a given point lasts in the neck region about 3.5 seconds, and from 5 to 9 seconds in the thoracic region. Schreiber's conclusion

* Presented at the Meeting of the American Gastro-enterological Association, New York, April 24, 1905.

† Dr. Meltzer states (New York Medical Journal, 1894, LIX, p. 391), before generalizing, that these results are true, at least, of his esophagus.

that the wave moves rapidly in the cervical portion and slower in the thoracic portion, with no pause between the two, confirms the observations of Moser and myself on lower animals. We noted[8] in the dog and cat that food was pushed onward rapidly in the upper part of the esophagus, and considerably less rapidly from the top of thorax or the level of the heart to the stomach. If the esophagus contracts in sections, with an interval of two or three seconds between the contraction of adjoining sections, a checking of the progress of the bolus should be expected at the change from the rapid to the slower rate. But no interruption of the onward movement was observed in the dog, and only occasionally was it seen in the cat—there was merely a gradual slackening of the speed as the bolus reached the lower esophagus.

The Cardia.—It is generally stated that normally the cardiac sphincter is in a state of tonic contraction. As long ago as 1860, however, Basslinger[5] described a rhythmic alternation of contraction and relaxation of the rabbit's cardia. In observations on the cat (still unpublished) I have seen rhythmic relaxations of the cardia, so that fluid food streams from the stomach into the esophagus even above the level of the heart, then is pressed into the stomach again by a peristaltic wave, only to be released a moment later to pour into the esophagus anew. I have watched this activity recurring at intervals of one or two minutes for more than a half hour. It usually begins soon after fluid food is given; within a varying period the intervals between discharges gradually lengthen until the action entirely ceases and the cardia seems tightly closed. During this ebb and flow of food in the esophagus the animal evinces no signs of distress, and if allowed her freedom, does not vomit. On re-examination the movements are again seen. The regular appearance of these phenomena in different animals makes me think that they must be normal. It may be that relaxations of the cardia of this character are associated with eructations of gas and stomach contents in cases of gastric fermentation.

Kronecker and Meltzer have maintained that even when food is squirted down the esophagus, it normally rests above the cardia until pressed through into the stomach by esophageal contraction. But if several swallowings follow one upon another, the cardiac sphincter becomes relaxed, so that the movement of the food to the stomach meets no resistance.[6]

In rabbits, after a peristaltic wave had pushed the food from the esophagus into the stomach, Meltzer observed[6] a strong contraction of the sphincter, immediately followed by a deep diving of the entire cardia into the stomach, as if pressing down the contents of a filled bag.

The functions of the cardia therefore may be to keep the passage into the stomach free from an accumulation of the swallowed food, and, so long as the sphincter remains contracted, to prevent a regurgitation of gastric contents.

The Stomach.—The stomach is a region of storage for the food, and also a region in which carbohydrate and proteid digestion may occur. These functions of the stomach are performed in different parts of the organ.

Undoubtedly the most important feature of the newer physiology of the mechanics of the stomach is the knowledge that it consists of two parts physiologically distinct. The larger left part of the stomach is the cardiac portion, the right is the pyloric portion. The pyloric portion is characterized during digestion by the continuous passage of peristaltic waves over its surface to the pylorus.[7] The cardiac portion is without peristalsis, but as the food is pressed from the pyloric portion into the intestine, the muscles of the fundus by tonic contraction squeeze the contents into the more active division, as into a hopper.[8]

The rate of gastric peristalsis varies with different animals. In the cat four to six waves pass a given point in a minute; in the dog, between four and five.[9] Moritz[7] states that in the human being the rate is about three per minute. I have confirmed his statement by means of auscultation. When food containing air is eaten, and the subject lies on his left side, a sound can be heard over the pylorus recurring rhythmically at intervals of about 19 or 20 seconds.

The efficiency of peristalsis in mixing the food with the gastric secretions depends upon the contraction of the pyloric sphincter. So long as the sphincter holds, each constriction-ring coursing from the middle to the end of the stomach presses the food into a blind pouch; the food, unable to escape through the pyloric opening, has as its only outlet the opening in the advancing ring. This is an admirable device for bringing the food under the influence of the glandular secretions of the pyloric region. For, as a constriction occurs, the secreting surface enclosed by the narrowed muscular ring is pressed close around the food within the ring. As the constriction advances it continually presses inward fresh glandular tissue, and furthermore, as the constriction advances, a thin stream of food is continuously forced back through the ring and thus past the mouths of the glands—a food stream sweeping in one direction past an ever-refreshed mucous surface moving in the opposite direction. Thus is the food repeatedly exposed to the secreting surface of the pyloric end and thoroughly mixed with the gastric juice.

The larger cardiac end of the stomach is the reservoir for the food. As peristaltic waves are absent, the food remains unmixed with the gastic juice and the inner parts may retain their original reaction for even two hours. In 1898 I pointed out that in this larger part of the stomach salivary digestion may readily take place without interference by the acid gastric secretion. In 1903 Mr. Day and I[10] proved that when carbohydrate food is mixed with saliva the cardiac portion contains at the end of an hour about 80 per cent. more sugar in unit volume than the

pyloric portion. These observations have been confirmed by Grützner,[11] who has also shown that when new food enters a partially full stomach, it passes into the midst of the cardiac mass and displaces outward the food already there. The possibility of salivary digestion in the stomach is thereby assured.

The value of the stomach as a place for holding the bulk of the food and serving it out so gradually that the intestine is not overwhelmed during its digestive and absorptive processes, was pointed out by Moritz.[12] The advantages thus secured to the intestine may be claimed also for the stomach itself, for the active portion is the pyloric portion, and the fundus serves as its resvoir—an active reservoir pressing out its contents a little at a time, as the pyloric peristaltic mechanism is ready to receive them.

The Pylorus.—Differing views have been set forth as to the manner in which the pylorus opens and permits the exit of the food. Some investigators[13] have declared that the sphincter relaxed only at the end of several hours to allow the stomach to empty. Observations under more natural conditions, with the stomach-tube[14] and with the X-rays,[8] show that the stomach is not emptied at once at the end of gastric digestion, but progressively during the period. There is thus an intermittent closure of the pylorus. The channel is usually closed, yet occasionally it opens; and when it opens, the peristaltic waves, usually engaged in churning the food, now serve to propel it into the intestine.

The factors affecting the pylorus are as yet but little understood. It is known that the discharge of food from the stomach is delayed by the presence of acid[15] or fat[16] in the duodenum. Hard particles brought to the sphincter by gastric peristalsis also prolong the periods of contraction.[8] Under these circumstances the hard particles are repeatedly swept up to the pylorus, only to be repeatedly shot back through the advancing ring of constriction. By this continual rubbing the waves of peristalsis serve to break up the more solid pieces of food, a function performed by the teeth with manifestly greater efficiency. It is possible that the prevalence of pathological conditions in the pyloric end of the stomach, rather than in the cardiac end, is due to injuries which the greater activity of the pyloric end may bring upon itself.

What agency causes the pyloric sphincter to relax? It seems probable that the signal for relaxation is the presence of free hydrochloric acid on the stomach side of the pylorus. Penzoldt[17] noted that foods delaying the appearance of free hydrochloric acid remained longest in the stomach. His observations, however, did not decide which of the factors, gastric peristalsis or the pylorus, caused the retardation of the food. In the Harvard Physiological Laboratory last year it was proved[18] that when carbohydrates, proteids and fats of the same consistency are separtely fed in equal amounts, they do not leave the stomach at the same rate. Fats remain long in the stomach; the discharge begins slowly and continues about as rapidly as the fats are absorbed or passed into the large intestine. Carbohydrates begin to leave the stomach soon after their ingestion (within ten minutes); they pass out rapidly and at the end of two hours reach a maximum amount in the small intestine,—almost twice the maximum for proteids and two and one-half times the maximum for fats,—both of which maxima are reached only at the end of four hours. Proteids frequently do not leave the stomach at all during the first half hour and occasionally not for an hour. After two hours they accumulate in the small intestine to a degree only slightly greater than that reached by carbohydrates an hour and a half earlier. The departure of proteids from the stomach is much later than that of carbohydrates and slower than either carbohydrates or fats. There is evidently a remarkable mechanism at the pylorus which permits carbohydrates, not digested by the gastric juice, to pass quickly into the intestine where they are digested, and retains the proteids, digested in the stomach, there to undergo digestion.

If the presence of free acid on the stomach side of the pylorus stimulates the relaxation of the sphincter, this mechanism is largely explained. The theory of the action of the pylorus which I suggest is as follows:[19] Free acid in the stomach opens the pylorus and initiates the chemical control of the sphincter. The opening of the pylorus permits the exit of a portion of the acid chyme. We have seen that acid in the duodenum keeps the pylorus closed; but acid in the duodenum also stimulates the flow of the alkaline pancreatic secretion.[20] No inorganic acid is normally present beyond the first few inches of the small intestine.[21] The acid therefore is here neutralized. As the neutralizing proceeds, the stimulus closing the pylorus is weakened, until the acid in the stomach again opens the sphincter. Again the acid food passes out and the acid closes the sphincter to further passage until the duodenal changes finish their slower course.

Thus, automatically, carbohydrates would go early and quickly into the intestine to meet their proper ferment; thus, automatically, proteids, postponing the presence of free hydrochloric acid by uniting with it, would be retained in the stomach to suffer alternation by the gastric juice and only after such alteration be permited to go on. Thus, automatically, the intestine would be saved from overwhelming discharges from the gastric reservoir; and by this same automatic mechanism the gastric secretion, harmful to the action of intestinal ferments, is rendered innocuous because of its admission, little by little, into the duodenum.

The Small Intestine.—The small intestine is not only a region of digestion but also a region of absorption. Throughout its length there are no sphincters. Peristalsis cannot act therefore to mix the food with the secretions or expose the digested food to the absorbing wall. The admir-

able process by which these functions are performed, I have called "rhythmic segmentation."[22] In the small intestine there are then two mechanical activities, rhythmic segmentation of the food, the most common activity, and peristalsis. The rhythmic movements of the small intestine have been variously described as shortenings and narrowings of the gut, rhythmically repeated at nearly the same intestinal circumference; as alternating to-and-fro movements of the long axis without changes in the lumen; as local or extensive periodic contractions and relaxations mainly of the circular musculature; and as waves involving both muscular coats of the intestine and traveling from above downward at a rapid rate.[22] Ludwig gave these rhythmic movements the rather undescriptive name "Pendelbewegung," or pendulum movement. Some of the rhythmic movements above mentioned are undoubtedly abnormal and due to the method of observation employed. The effect of the movements in normal cases is to mix the food and expose it to the mucosa without advancing it appreciatively along the canal.

In this process of rhythmic segmentation a mass of food which has been lying at rest is separated into a number of equal segments by constrictions of the circular muscles occurring at intervals along its length.[22] Scarcely have the constrictions formed when similar constrictions begin to appear about the middle of each segment. As these new constrictions deepen, the first constrictions begin to relax. Finally, when the new constrictions have completely divided the segments, the first constrictions have entirely relaxed and the neighboring halves of the divided segments unite to form new segments in the region of the first constriction. These new segments are again divided by circular constrictions about their middle, and neighboring halves of these divided segments unite to make a third series, and so on. This process of rhythmic segmentation of the food may go on for several minutes in the duodenum so that the food, coming from the stomach, becomes thoroughly mixed with the outpouring secretions of the liver and pancreas. It is usual for the process in the duodenum to be brought to an abrupt end by active peristalsis. In other parts of the small intestine rhythmic segmentation of the food may continue for half or three quarters of an hour without moving perceptibly along the canal. In the cat the segmentation may occur about thirty times in a minute. The food may thus be divided and redivided over and over again a thousand times or more with no advance. This operation has been observed in the dog at the rate of from eighteen to twenty-two segmentations per minute. I have never watched the movements of the small intestine in man, but I have been able with the stethoscope to hear in the lower abdomen rhythmic sounds repeated with remarkable regularity at intervals of seven or eight seconds. It seems to me probable that these sounds are associated with movements of rhythmic segmentation, for I have heard similar sounds attending segmentation in the cat. If this is true the rate of segmentation in the human being would be seven or eight times per minute. The process of rhythmic segmentation thoroughly mixes the food with the digestive secretions of the liver and pancreas and of the intestine itself, and thoroughly exposes the digested food to the absorbing walls, for, with each constriction, the absorbing mucous membrane is plunged directly into the midst of the little masses of food. This remarkable activity must also affect the flow of blood and lymph, since Mall[23] has shown that contraction of the intestinal wall forces venous blood from the submucous plexus into the radicles of the superior mesenteric vein and has noted that it must similarly affect the flow of the lymph.

The progression of the food through the small intestine is possibly caused to a very slight extent by the segmenting process, but it is typically performed from time to time during digestion by the well-known peristaltic wave, which has so long been regarded as the chief activity of the intestinal muscles.

The Ileocolic Sphincter.—In 1902 Katz and Winkler,[24] and in 1904 Elliott[25] demonstrated that at the junction of the small and large intestines there is, at least in the dog, cat and rabbit, a distinct sphincter under nervous control, and not a mechanical valve. This sphincter is normally in a state of tonic contraction and serves to keep separated the contents of the small from those of the large intestine. There is some anatomical and histological evidence that also in man the term "ileocecal valve" should be replaced by "ileocolic sphincter," but physiological evidence of the presence of this sphincter in human beings has not yet been produced.

The Large Intestine.—When the large intestine is full the material in the distal portion is usually composed of rather hard lumps, while that in the proximal portion is soft and of uniform consistency. The condition of the contents in these two regions indicates a division of the large intestine into two parts, and the mechanical activities of these two parts correspond to the differentiation. In the distal portion the material is slowly advanced by rings of tonic constriction. In the proximal portion the common movements are waves of constriction running *backward* toward the cecum.

The antiperistalsis of the proximal portion of the large intestine was incidentally observed in the cat by Jacobj[26] during a research on colchicum poisoning. In 1902 this activity of the large intestine was established as the normal activity in the undisturbed animal by observations with the Roentgen rays in the Harvard Physiological Laboratory.[22] In 1904 Elliott and Barclay-Smith[27] confirmed these observations on the cat and found that in the rat, guinea-pig, rabbit, and occasionally in the hedgehog and ferret, antiperistalsis may be observed in the proximal colon. They also point out that the contents of the hu-

man cecum and ascending colon are of uniform soft consistency, whereas those of the transverse and descending colon are generally firm. As these distinctions correspond to those observed in animals in which antiperistalsis in the proximal large intestine has been seen, it seems highly probable that the human cecum and ascending colon are likewise characterized by this activity.

The antiperistalsis in the large intestine makes reasonable the presence of a sphincter or valvular structure at the point where the small intestine enters the large, for in so far as the sphincter is competent to restrain the food in the large intestine from returning into the small, the antiperistaltic waves have the same effect as the peristaltic waves in the stomach, pushing the food against the closed pylorus. When a constriction occurs some of the mucous surface of the colon becomes enclosed by the narrowed muscular ring, and, as this constriction passes on, fresh areas of this surface are pressed in around the narrow orifice, while a thin stream of food is passing by it in the opposite direction. The waves recur about five times a minute in the cat, and the period of activity, which lasts about five minutes, is usually repeated every fifteen or twenty minutes. During each normal period of antiperistalsis twenty-five waves or more must pass over the food in the cecum and proximal colon in this churning manner. The result must be again a thorough mixing of the contents with the digestive secretions brought from the small intestine, and an exposure of the digested food to the absorbing wall.

In 1894 Grützner declared that he had found material, injected into the rectum, carried back into the small intestine even as far as the stomach. Since then some observers have confirmed, others have doubted Grützner's results. The presence of antiperistalsis in the colon led me to believe there existed an activity which would fully account for Grützner's findings. Accordingly I injected into the large intestine enemata of different amounts and of different consistency. In every instance antiperistaltic waves were started by the injected mass and the material was therby carried in considerable amount to the cecum. Never in my experience have small or mushy enemata been carried back through the ileocolic sphincter. But when large injections were given, even of the consistency of thick cream, *i.e.*, amounts nearly filling the colon and cecum, the antiperistaltic waves may carry the food from the large intestine into the ileum. Radiographs taken at different intervals after the injection show that the antiperistaltic waves as time passes may almost completely empty the proximal colon, and that the small intestine gradually receives more and more food. After a short time typical segmenting movements can be seen in the loops.[25] Evidently, so far as mechanical activities are concerned, the small intestine is bipolar: food entering at either end is worked over with the same mixing and absorbing activites.

With each new accession of food in the large intestine a strong tonic constriction of the cecum and proximal colon occurs, which presses onward into the distal colon some of the contents of these parts. Antiperistaltic waves follow at once the tonic contraction, so that much of the food which has been pressed onward is returned toward the cecum. With the repetition of this process, however, more and more material accumulates in the distal colon until finally a persistent ring of contraction separates this material from the region of antiperistalsis; as still more food appears in the large intestine this ring moves slowly onward toward the rectum, pressing the mass before it, and is followed by other similar rings carrying onward similar masses by very slow peristalsis. The masses of waste material thus advanced accumulate in the lower part of the distal colon and are ultimately passed from the body in the act of defecation.

In the cat defecation is preceded by the disappearance of the slowly moving peristaltic rings in the lower part of the distal colon and the appearance of a strong, broad constriction near the beginning of this region. The band of constriction is then drawn downward by a shortening of the longitudinal muscles. Thereupon the constriction, which divides the lumen, moves slowly along and, with the aid of the voluntary abdominal muscles, pushes the separated mass through the relaxed sphincters out of the canal.[22] Elliott and Barclay-Smith[27] observed in all the animals they studied a similar powerful constriction of the tube occurring at a definite point some distance up the colon and spreading thence downward so as to empty the distal segment, and in many animals there was also a contraction of the longitudinal muscle which, fixed in the perineal region, draws the colon down into the pelvis and thereby aids the constriction that performs evacuation.

THE INNERVATION OF THE ALIMENTARY CANAL.

In the foregoing review of the motor activities of the alimentary canal the main factors are shown to be the moving peristaltic wave and the stationary rhythmic contraction of circular muscle. To what extent are these movements independent of the central nervous system, and in what manner are they affected by their connection with that system? Before attempting to answer this question, it will be necessary to know the nervous relations of the alimentary canal.

Throughout the canal there lies, between the inner circular and the outer longitudinal fibers, a nerve net or plexus,[28] of primitive structure, characteristic of the walls of viscera and of simple animals such as the coelenterates. This nerve net (Auerbach's plexus) provides a local nervous mechanism.

Besides a plexus system the alimentary tract possesses intimate connections with the spinal cord and brain. The vagus nerve is distributed to esophagus, stomach, and small intestine; and pelvic visceral nerves, to the large intestine. Moreover the sympathetic nervous system sends fibers

to the entire canal from the cardia to the end of the colon.

The Local Nervous Mechanism.—The simplest form of activity in the alimentary canal is the local contraction of the circular fibers, the process of rhythmic segmentation. Bayliss and Starling found that in the dog with abdomen opened this movement consisted of constrictions repeatedly recurring at the same spot and traveling along the gut from above downward. When nicotine was injected into the blood vessels or cocaine was painted on the intestine, they found that the true peristaltic wave was abolished, but that rhythmic contractions continued.[29] The rhythmic contractions now traveled in either direction, instead of downward only. As cocaine and nicotine, in the amounts used, paralyze nerve cells, the rhythmic contractions were regarded as of muscular origin, and the transmission of the contraction a muscular transmission. Last year Magnus[30] succeeded in recording graphically rhythmic contractions of circular and longitudinal muscles of the intestine removed from the body and kept alive in warm salt solution. The contractions persisted after the removal of the mucosa and Meissner's plexus; but after separation of the circular and longitudinal muscular coats, the circular coat would respond to stimulation, but only the longitudinal coat registered the spontaneous rhythm. Examination proved that Auerbach's plexus was adherent to the longitudinal coat. Magnus concluded therefore that the rhythmic movements are of nervous origin. The question as to the neurogenic or myogenic origin of the rhythmic movements of the small intestine is therefore an open one.

The peristaltic activity of the alimentary tract shows different degrees of dependence on nervous influence. Elliott and Barclay-Smith[27] state that antiperistaltic waves of the large intestine are not abolished by nicotine. They class these waves with the rhythmic movements of the small intestine, as of myogenic origin.

The true perstalsis of the small intestine, according to Bayliss and Starling,[29] and likewise of the large intestine, according to Elliott and Barclay-Smith,[27] is a coordinated movement, dependent on a reflex in the wall of the canal. The movement continues after separation from the central nervous system, but is under local nervous control since it is destroyed by cocaine or nicotine. And, as Magnus has proved,[30] the seat of the reflex is in Auerbach's plexus. It is probable that the same reflex governs the stomach movements, for gastric peristalsis continues after the stomach is removed from the body.[31]

The local reflex causes the canal to respond in a uniform manner to stimulation. The uniformity of the response has led Bayliss and Starling to formulate a *law of peristalsis.*—"Local stimulation of the gut produces excitation above and inhibition below the excited spot." So long as the reflex mechanism is intact in the stomach, the small intestine, and the distal colon, antiperistalsis cannot occur—a conclusion which Mall's[32] observations on reversed loops of intestine fully support.

The peristalsis of the esophagus is singularly closely related to the central nervous system. For example, Mosso[33] proved that cutting across, or even extirpating a piece of esophagus did not stop the peristaltic wave, if connections with the central nervous system remained intact,—the wave, started above the cut, reappears below. Yet, as Meltzer[34] has shown, there is also in the esophagus a local reflex like that in the remainder of the alimentary canal; and if anesthesia is so deep that central nervous influences are eliminated, at least in part, from control of the peristaltic wave, the wave will move, but may be stopped by cutting or ligating the esophagus. On the other hand, it has been known since Reid's observations in 1839[35] that severance of the vagus nerves in the neck deeply disturbs the activity of this region, so that food accumulates in the esophagus and may remain there for hours without being advanced. I have determined that the delay is not due to spasm of the cardia, but to a paralysis of the esophagus.[36] It seems probable that the peristaltic contractions of the esophagus, to be efficient, must be supported by nervous influences from the outside. In this respect the esophagus is different from the remainder of the alimentary canal.

The Nervous Control of the Sphincters.—Whether the sphincters are controlled by the local nervous reflex active elsewhere in the alimentary tract is not yet experimentally settled. So far as the pylorus is concerned, cutting either the vagus nerves or the splanchnics does not destroy the mechanism maintaining the difference between the discharge of proteids and carbohydrates from the stomach.[36] Whatever the local control may be, the sphincters are certainly markedly affected by their connection with the central nervous system. It must be confessed, however, that our knowledge of the extrinsic innervation of the alimentary canal is still in an unsatisfactory state. The many contradictory observations cannot be set down here; I shall endeavor to present only the later and best-founded conclusions.

The observations of Kronecker and Meltzer,[2] and Openchowski[37] have proved that the vagus nerve carries to the cardia inhibitory impulses. Recently May[38] has declared that although the first effect of vagus stimulation is inhibitory, there is later a slow augmentation of the contraction. Langley[39] was able to separate inhibitory and augmentor impulses in the vagus with drugs; after curare, vagus stimulation caused contraction of the cardia, and after atropine, the same stimulation caused inhibition. Stimulation of sympathetic fibers, according to Openchowski,[37] brings about increased contraction of the sphincter.

At the pylorus the usual result of vagus stimulation is contraction,[37] although relaxation is occasionally observed. May[38] states that stimulating the vagus has the same effect on the pylorus

that it has on the cardia,—first an inhibition, followed shortly by an augmentation of contraction. Impulses from the splanchnics, so Openchowski states,[37] are chiefly inhibitory of pyloric contraction in the dog, but in the rabbit they are motor.

The ileocolic sphincter is not affected by the vagus, but stimulation of sympathetic nerves causes the sphincter to contract, and at the same time inhibits the circular muscle of adjoining parts of the ileum and colon.[38]

The Extrinsic Innervation of the Stomach and Intestines.—The vagus nerves contain motor as well as inhibitory fibers for the stomach. According to May[38] the stimulation of the vagus results in the same changes that have been described for the cardiac and pyloric sphincters; there is first an inhibition of the peristalsis of the pyloric end of the stomach and a lessening of muscular tone in the cardiac end, and this is followed by a much more vigorous peristalsis and, in the cardiac end, by an increased tone.

Most observers attribute to the sympathetic fibers of the stomach inhibitory functions alone; but Morat[40] has noted the opposite effect, and Openchowski[37] states that in the rabbit the sympathetic has chiefly a motor influence. May[38] fails to find any effect whatever following stimulation of the splanchnic nerves.

There is a greater unanimity of opinion regarding the motor innervation of the small intestine,—almost all observers ascribe to the vagi an excitatory influence. Bayliss and Starling[39] found that invariably stimulation of these nerves produced, after only a momentary inhibition, a marked and prolonged augmentation of the contractions of the circular muscles. On the other hand, although the very careful work of Bayliss and Starling[41] has disclosed only inhibitory action of the splanchnic fibers, many other observers have recorded a motor effect as well.[42]

The results secured by Bayliss and Starling, in their study of the innervation of the large intestine,[43] are quite in harmony with what they found true of the small intestine,—the pelvic visceral nerves arising like the vagus from the central nervous system, are augmentor nerves, whereas the supply from the sympathetic system is purely inhibitory in its action. Elliott and Barclay-Smith[27] have confirmed the observations of Bayliss and Starling, but find that the pelvic visceral nerves are distributed only to the distal part of the colon. The region of antiperistalsis does not, therefore, receive motor impulses from the pelvic nerves.

Inhibition of the Movements of the Alimentary Canal During Emotions.—Observations on the cat, made in the Harvard Physiological Laboratory in 1898, showed that gastric peristalsis is stopped whenever the animal manifests signs of rage, distress, or even anxiety.[8] With the similarity between the extrinsic innervation of the stomach and that of the intestinal tract, it was of interest to note that emotional states have the same effect on movements of the intestines that they have on movements of the stomach. Any signs of emotional disturbance, even restlessness and continued mewing, which indicate, perhaps, uneasiness and discomfort, were accompanied by total cessation of segmenting movements in the small intestine and antiperistalsis in the proximal colon, as well as complete quiescence of the gastric mechanism. Such signs of anxiety I have seen accompanied by entire inactivity of every part of the alimentary canal during more than an hour of continuous watching.[38] My observations on cats have been fully verified by Lommel,[44] who worked with dogs. Evidently chemical factors of digestion can have little importance, if fears and worry prevent the delivery of the food to regions of active digestion and absorption.

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A CASE OF PNEUMOCOCCUS INFECTION OF THE HIP.

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THE patient, a boy of four years, was brought to the Roosevelt Hospital Dispensary on September 21, 1904, by his parents, who gave the following history: They had had ten children, two of whom were dead; one of pneumonia, after an illness of three weeks, the other of measles.

No history of tuberculosis could be obtained. The child had had measles when two years old, and from the statement of the parents and of the family physician, it appeared that he had been seized two weeks ago with an attack of pneumonia characterized by cough, high temperature and prostration.

For the past five days the child's left hip has been "swollen." He has complained of pain in the joint and has been restless at night. The parents are sure that the hip gave no symptoms when the child recovered from his pneumonia.

Examination.—The child is evidently sick. Swelling and infiltration are present about the left hip. The veins over the swelling are prominent. Left thigh is held in abduction, outward rotation and slight flexion. Motions of the hip-joint are limited in all directions, but not much true muscular spasm can be brought out. There is deep fluctuation over the head of the femur. Temperature 103° F., pulse 164, respiration 38.

The patient was sent immediately into the hospital, where he was put to bed, with Buck's extension on his limb.

For my notes on the further progress of the case I am indebted to the courtesy of Dr. Hotchkiss, attending surgeon at the Roosevelt.

Physical Examination.—"Râles all over both lungs. Left lung: Many loose, larger and smaller râles, some sibilant râles all over front and back. Over small area in axilla slightly higher pitched inspiration. No dulness. Broncophony below left scapula. Leucocytosis of 24,400."

The following morning the temperature was 99.8° F., pulse, 144; respiration, 34. In the afternoon the temperature had risen to 103.6° F. The next day the joint was aspirated, and was found to contain a thick purulent fluid. Under ether an incision was made down to the joint over the head of the femur, and the pus was evacuated. The capsule was found torn and the head of the bone eroded. A counter opening was made on the inner side of the thigh, and drainage tubes were inserted. According to Dr. N. E. Ditman, assistant pathologist of the hospital, a specimen of the pus "contained organisms identified as pneumococcus." The identification was morphological only.

The patient suffered from shock, but rallied. From now on his temperature ranged between 99.3° and 104.8° F.

"October 10, under ether, an incision about two inches long was made down to the periosteum, over ninth rib. The periosteum was divided and pushed away, and about one inch of the rib was resected. Pleural cavity opened. A quantity of yellow pus exuded, composed chiefly of fibrin, No bacteria found. Tube inserted. Dry dressing."

After this operation, the child seemed to improve for a time, but on October 29 his temperature reached 104.4° F. On that date a counter opening was made behind the hip, and a rubber tube was inserted, connecting with the others previously put in.

On October 31 the patient suffered from a considerable hemorrhage from the anterior sinus of the wound. The bleeding recurred on the next day, and on November 2 the child died. No autopsy was done.

The case derives added interest from the rarity of attack of the hip-joint by the pneumococcus. As far as I have ascertained, this is but the second hip reported.

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PNEUMONIA.—ETIOLOGY AND EPIDEMIOLOGY.

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THE etiology of pneumonia has been so thoroughly worked out, and so often and clearly presented, that it is now well understood by every one who keeps fairly well abreast of current literature bearing upon this subject. Although this is true of the broad and fundamental facts, we yet lack that exact information upon many of the details which are essential to a complete understanding of all the relations existing between the causative germ, its environment and the developed disease. Enlargement of our field of knowledge in these directions will almost certainly lead to the formation of rational, simple and readily available measures of prophylaxis which will radically change the current history of pneumonia—the greatest scourge of our land.

The idea that pneumonia is a specific infectious disease has for centuries found lodgment in medical literature, as I have already shown.[1] From the contemplation of theory to a search for facts is natural progression. It is not surprising

1 Wells. Jour. Am. Med. Ass'n, 1889, XII, 258; 332.

therefore, that, thirty years ago, Klebs should have been diligently searching the bacterial field for a cause for this disease, and that he should have selected his "monas pulmonale" as the probable causative germ. It is difficult for us today, from the published description, to identify this "monas pulmonale" with any of the micro-organisms which abound in the secretions of the pulmonary air passages. Dr. Klebs, however, informed me a few years since that it was identical with the pneumococcus.

The pneumococcus, now the recognized cause of pneumonia, was discovered, independently, by Sternberg and Pasteur, in 1880; later Fränkel, Weichselbaum and others, demonstrated the presence of this bacteria in, practically, all cases of pneumonia. Its morphology and cultured characteristics have been very fully described within recent years, especially by Washbourne, Eyre and others. In this connection I shall only pause to call attention to the observation, of far reaching importance, that the various strains of pneumococci vary widely in physical characteristics and, especially, in virulence; and that in each of these such variations may be accentuated by environment and cultivation. The plain inference to be drawn from this fact is that herein lies the true explanation for the increasing prevalence, and mortality of pneumonia, which I have shown, exists.

The pneumococcus is present in the fauces and neighboring cavities in a very large proportion of healthy persons. In a series of 135 persons I found it upon the tonsils of 45 per cent., and, as the result of further observation, I am quite sure that this is considerably below the true proportion. The pneumococcus in this location appears to be innocuous, producing pneumonia only when it reaches and develops in the pulmonary alveoli. Any condition which renders the laryngeal and bronchial reflexes paretic, as, *e.g.*, prolonged exposure to cold, privation, exhaustion, or even profound sleep, may permit the gravitation of pneumococcus-laden secretions from the upper respiratory passages to the alveoli, and this is probably the usual route followed by the infectious germ. The fact that the pneumococcus is found in the blood in practically all cases of pneumonia makes it incumbent upon us to consider the possibility of the bacterium entering the general circulation first, with subsequent localization in the lungs, but I am of the opinion that the respiratory path is the one usually, or invariably, taken.

In making systematic observations upon smears from tonsillar surfaces I had not progressed far before this curious and, I believe, most important fact was noticed, namely, that in some families the pneumococcus was present in every member, or at least in a majority of members, while in other families it was found in none; also that in families of the first class there was often a history of more or less recent cases of pneumonia, while such history was usually absent in families of the other class. Some notable exceptions were found to this rule: For example, in one large family there was a case of pneumonia, none but the patient being affected with pneumococcus. In two instances every member of moderate-sized families had the germ in their throats, but none had ever had the disease mentioned. The distinguished discoverer of the pneumococcus informed me, recently, that although he has been the host of this organism for at least a quarter of a century he has never been the subject of pneumonia. No person who has previously had pneumonia examined by me has been found free from the pneumococcus, no matter how long the intervening period. We may well believe that these are the most vigorous trains of the pneumococcus, and that such are most likely to survive, become the most widely disseminated and produce the severest and most dangerous effects.

The pneumococcus is probably disseminated, in the main, by coughing and sneezing, the pneumococcus-laden secretions being thrown into the air as a spray, and thus inhaled by others. This assumption, considered as being true, explains many of the well-known etiological facts of pneumonia: Thus it would reasonably explain the notorious increase in the prevalence of the disease; its increasing severity and danger; the acknowledged dangers attending the congregation of people in public places, especially at times when many persons are coughing and sneezing; the occurrence of recurrent and family cases, house and local epidemics, etc.

In a paper published about fifteen years ago I recorded a number of instances in which pneumonia occurred as a house epidemic, and several have since been observed, the latest as follows:

In a family of four persons the two children had severe pneumonias, with recovery, in March, 1904; the mother is now recovering from a severe attack; the father had the malady several years ago. In September the children and the mother had the pneumococcus in their throats; no opportunity was had to examine the father.

Many remarkable examples are found in the literature:

In Metropolis, Ill., Dr. Magrum died of pneumonia December 26, 1898; the only daughter on the following day; his widow on December 30; the only son the following week; the grandmother January 10, 1899—the entire family within two weeks.

In one household, near Port Jervis, N. Y., in 1900, six persons were ill at one time, with pneumonia—three died; three recovered.

Campbell reports a mother and two young children ill at the same time; both the children with empyema as a complication. Charles and Dewar report four cases in one house, two youths and two children; in both the latter pleurisy with effusion was present.

Withington reports a family of four old women, in which pneumonia attacked every member within a month. Bogue reports five cases in a family of nine persons; Copeman five in a family of seven; Graf seven cases in one house; Weber eight families with six cases, and two families

with five cases; Edsall and Chriskey six cases, consecutively developed in the same hospital bed.

In these cases we must reckon with the wide and ill understood question of susceptibility. It is well known, but seldom mentioned, that there is, at times, and from unknown causes, a peculiar susceptibility to various infectious diseases. For example, sporadic cases of diphtheria, scarlet fever, measles, smallpox, etc., may be introduced into a community without the disease obtaining an epidemic foothold, while at other times the slightest and most remote contact propagates the malady with surprising rapidity. It must have been noticed by every observing physician that revaccination is much more successful during the epidemic presence of smallpox and in some epidemics than in others. This same unusual susceptibility, I am quite sure, exists in some outbreaks of pneumonia; and independently of the general characteristics of the pneumococcus.

To be sure there may be atmospheric influences acting upon the germs as they lie in the throat, which tend to increase their activity; possibly to such an extent that the system becomes affected by the pneumotoxins, with reflex pareses as a consequence, and thus opening the gateway to the pulmonary alveoli. Such influences may be temporary, as when local epidemics of short duration occur; they may be most profound, as when the disease is widespread along with influenza; it may be securely fixed in a locality, as may be noticed in comparing the fearful prevalence and frightful mortality in the City of Mexico as compared with that existing in, *e.g.*, Cairo or Melbourne. I am quite sure that studies along these lines will lead to interesting and important results.

From the consideration of recurrent, consecutive family cases and house epidemics to that of the epidemic prevalence of pneumonia is but a short step. This disease, as is well known, sometimes prevails as an epidemic, and when widespread or very fatal necessarily attracts the attention of the medical observer. Accounts of the most remarkable of these outbreaks usually come to us from the most remote times and the greatest distances, and there must always remain doubts as to whether some of the great epidemics of which we read, were truly pneumonic in character.

Thus, *e.g.*, the plague of Athens, which, after devastating Ethiopia and the Mediterranean shores, destroyed more than a quarter of the inhabitants of the Grecian capital, has been considered a form of pneumonia, although the wonderfully graphic account of the disease left by Thucydides—himself a sufferer from the malady and one of the few who recovered—scarcely warrants the conclusion. The black death of the middle of the fourteenth century, which swept away one-third of the inhabitants of every land which it visited, has been considered—erroneously, I believe—a form of pneumonia. The marked features of this malady were ardent fever, cough, sanguineous expectoration, fetid breath, epistaxis, diarrhea and petechia. The disease was considered so contagious that to be near those affected was to invite certain death, "so that parents abandoned their infected children and all the ties of kindred were dissolved."

In 1889 I published a table which included all the recorded epidemics of pneumonia to which access was attainable. Since that time I have made numerous corrections and additions, bringing it down to the present. These are sufficiently important to warrant inclusion in this paper.

EPIDEMIC OF PNEUMONIA.[1]

1873	Magdeburg.	Schaefer, Inaug. Diss., Halle, 1885-7.
	Kiel.	Schroeder, Inaug. Diss., Kiel, 1883, 35.
	Dublin.	Newsholme, Allchin's Pract., 1900, i, 180.
1874-5	Frankford Prison.	Rodman, Am. Jour. Med. Soc., 1876, cxli, 76.
	Alzenau, and other towns in Bavaria.	Graf, Inaug. Diss., Würzb., 1876.
	Windham, Me.	Dunn, Rpt. Me. Bd. Health, 1885, 259.
	N. Mecklenburg, N. C.	Alexander, Charlotte Med. Jour., 1896, 457.
1877-8	Florence.	Banti, Gaz. Med. Ital. Prov. Venet., 1883.
1878	Park Co., Indiana.	Goldsberry, Ft. Wayne Med. Mag., 1895, iii, 353.
1879	Boston.	Bost. Med. & Surg. Jour., Jan. 20, 1879.
	Uster, Switzerland.	Ritter, Archiv. f. k. Med., xxv, 53.
	Verona.	Messalonga, Arch. Gen. de Med., 1880, v.
	Cologne.	Knövenagel, D. mil. ärtzl. Zeit., xii, 286.
	Amberg Prison.	Kerchensteiner, Bayer. ärtzl. Intellig., 1881, xxxviii, No. 20; Emmerich, Arch. f. Heilk., 1884, ii, 117.
1882	Zang, Germany.	Schmidt, Berl. klin. Woch., 1883, No. 22.
1883	Reipisch.	Schäfer, op. cit.
	Salpêtrière, Paris.	Newsholme, op. cit.
1885	Village near Fulda	Coleman, Inaug. Diss., Würzb., 1886.
	Tübingen and Lustenau.	Rall, Inaug. Diss., Erlangen, 1887.
	St. Petersburg.	Triwus, Vratch., 1885.
	Sheffield, Conn.	Mason, Rpt. Conn. Bd. Health, 1885, 338.
	Scunthorpe, Eng.	Couldrey, Lancet, 1885.
1885-6	Umbala, India.	Duncan, Lancet, 1895, i, 193.
	Toronto.	Geike, Trans. Int. Med. Cong., 1887.
	Bolton, Ontario.	Warbrick, Personal Communication.
	Dingwall, Eng.	Bruce, Brit. Med. Jour., 1886; Adams, Ibid., 1887.
1886-7	Belfast.	Lancet, 1887, ii, 1146.
	Muskingum Valley.	Bell, Med. Index, 1887.
	Dingwall and Wylain.	Foulis, Brit. Med. Jour., 1887.
	Poland.	Jour. Amer. Med. Assoc., Dec. 1, 1888, 781.
1887-8	Terrevalle and Partima.	Naldoni, Gaz. d. Osped., 1888.
	Canton St. Syphronie.	Bard, Lyons Med., 1889, xiii, 43.
1888	Middlesborough.	Sadler, Lancet, July 14, 1888; Ballard, Ibid., 1890, i, 1087.
	Bonn; Fischbach.	Ditzel, Inaug. Diss., Würzb., 1889.
1888-9	Germany, many places.	Angyan, Wiener m. Woch., 1890, No. 7; Levy, Berl. k. Woch., Feb. 17, 1890.
1889	Prince Edward's Island.	N. Y. Med. Rec., July 13, 1889, 44.
	London.	Brenchley, Lancet, 1890, i, 1425; Wilkes, Ibid., 1889, ii, 1362.
1890	Scotter.	Parsons, Epid. Pneum. in Scotter, 1890.
	Sheffield.	Gwynne, Brit. Med. Jour., Nov. 1, 1890.
	Busenberg.	Detzel, op. cit.
1891	Heidelberg.	Gartner, Centralb. f. Gyn., 1891, No. 27.

1 For earlier epidemics of this disease, see Journal American Medical Association of February 23, 1888.

1893	Yeardon.	Whitelegge, Allbutt's Syst. Med., i, 656.
	Pratt Mines, Ala.	Cochran, Med. Rec., Nov. 18, 1893, 664.
	Germany, various parts.	Lang, D. m. Woch., 1895, No. 10.
1893-4	Cawdor, Scotland.	Brit. Med. Jour., 1895, i, 360.
1894	Pittsburg.	Boyce, Pittsb. Med. Rev., 1894, viii, 148.
	London.	Richardson, Asclep., 1894-5, xi, 350.
	Lexfield.	Low, Pub. Health, Lond., 1894-5, vii, 34.
1894-5	Louisville.	Marvin, Am. Pract. & News, 1895, xix, 415.
	Sarnthal, Austria.	Foppa, Oestr. sanit. L. Wes., 1896, viii, 353.
1895	Pachbadra Rajputan.	Banerjee, Ind. Med. Gaz., 1896, xxxi, 95.
	France, various places.	Poulet, Bull. Soc. Ther., 1895, ii, 1314.
	Flint, Eng.	Reece, Brit. Med. Jour., 1895, ii, 1314.
	Peshawar, India.	Stephenson, Lancet, 1896, i, 1630.
1896	Soudan.	Brit. Med. Jour., 1896, i, 1229.
1897	Edwardsville, Ill.	Personal Communications.
	Kimberly.	Kolle, D. m. Woch., 1898, xxiv, 425.
1898	Valley Falls, N.Y.	Ferguson, Jour. Am. Med. Assoc., xxx, 966.
	Metropolis, Ill.	Med. News, 1899, lxxiv, 88.
	Middlesborough.	Dingle, Rpt. Health Of., Middlesb., 1899.
	Bakersfield, Cal.	Snook, Personal Communication.
	Italy.	Molteni, Gaz. d. Osped., June 5, 1898.
1899	Ardara, Ireland.	Hamilton, Brit. Med. Jour., 1899, i, 1214.
	Janesville, Pa.	Doolittle, Med. News, 1899, lxxv, 173.
	Albia, Iowa.	Gray, Iowa Med. Jour., Sept., 1899.
1901-2	Leavesden Asylum	Sinigar, Lancet, 1903, i, 169.
1902-3	Quincy Soldiers' Home.	Montgomery, Ill. Med. Jour., Feb., 1904.
1903	Chicago.	Reynolds, Bull. Health Dept., May 31, 1901.
	Neubrunn.	Spaet, Münch. m. Woch., Oct. 6, 1903.
	Johannesburg.	Brit. Med. Jour., 1904, i, 277.

Thus it is seen that in every quarter of the globe having a medical history epidemics of pneumonia have been recorded. It is noticeable, however, that the elevated regions of western Europe have been visited oftenest. The epidemics have occurred most frequently in winter and spring; occasionally in autumn; infrequently in summer. They have often followed in the wake of influenza or some other epidemic disease, but such appearances have been, so far as possible, eliminated from consideration in this connection.

Upon many epidemics peculiar features have been impressed which serve to distinguish them from all others. These variations may be noticed in the classes of persons attacked; mode of invasion; course and symptomatology; complications and sequelæ; fatality and morbid anatomy.

Thus the Alaska epidemic of 1881 was confined, with a single exception, to the native population. "A singular coincidence connected with the outbreak was its appearance at these places immediately or soon after the arrival of the first vessel in port. This circumstance so impressed itself upon the native mind as to give rise to the general and strong belief in the importation of the disease." The malady was marked by great dyspnea, cyanosis, insomnia and profound physical and mental depression—indeed the latter was so profound that it was almost impossible to impart the slightest ray of hope to the patient. The course was rapid and the fatality great.

The epidemic of Obersichte was remarkable in that the malady was confined to young children. From March 20 to April 2, 15 out of 50 children under five years of age were attacked with pneumonia. For a long time previously, and subsequently, there were no other cases of the disease in the village or vicinity.

In the Rietnordhausen epidemic the school children were first attacked, and as the disease spread it affected, mainly, the families to which these children belonged. There were a total of 42 cases, with two deaths, the malady running a very mild course.

The Kimberly epidemic was confined to the Kaffirs. Many remarkable features were noted: There was, in most cases, a nasal discharge of greenish pus. In a large majority of the cases there was only slight pulmonary involvement, and the prostration was so slight that the patients continued their work. Parotitis, dysentery and meningitis were frequent complications. In all cases in which dysentery existed the patients died, and it was present in nearly all fatal cases. There were, in these cases, no gross intestinal lesions. In a large number of fatal cases extensive purulent meningitis was found, although there were, during life, no symptoms pointing to this condition. In these cases death was sudden and unexpected. Every stage of pneumonic consolidation was found post-mortem. Slight pleural and pericardial effusions were frequent. Pure cultures of the pneumococcus were found in the nasal discharge, the meningeal pus and the hepatized lung.

Epidemics of pneumonia have occurred on shipboard, as in the case of the two vessels in Halifax harbor; the ships Isle de France, Bourbon, and Sechelles, in Madagascar; the Alger, Cressy and St. Jean d'Acre, in the Mediterranean. Of 720 persons on board the Cressy 298 were attacked, and of 815 on board the St. Jean d'Acre 410 were affected. The disease was considered contagious, and seemed to be communicated to inmates of the Malta hospital by patients sent there from the ships.

In the Irish epidemic of 1854-5, and in the Italian outbreak of 1898, the disease was truly ephemeral.

The Boston epidemic of 1876 was characterized by a slow and insidious invasion, a prolonged course and frequent hemorrhages.

The Moringen prison epidemic presented such unusual features as diarrhea, enlargement of the spleen, albuminuria and acute nephritis, pleuritic effusion, pericarditis, meningitis and great prostration.

In the epidemic of Deri Gazi Kahn, in which 40 out of 550 persons lost their lives in a few weeks, the local morbid process proceeded with the utmost rapidity through all the stages of inflammation to suppuration, abscess and gangrene. Both lungs were usually affected, and after death were found to be, to a great extent, disorganized. The pleura were generally thickly covered with lymph and the cavities filled with a dirty sanguinolent

fluid. The blood was thin and refused to coagulate. The teeth were covered with sordes, and, from the first, prostration was profound.

In the Rouen epidemic a purple eruption covered the body; the face was pale, the tongue dry and the abdomen tympanitic; the lungs and stomach were often gangrenous; almost all the patients had a fetid diarrhea. Purpura and helminthiasis were prominent features of the Provençe, and of the Languedoc outbreaks. Almost every patient in the Loberg epidemic had icterus. Herpes was present in all the Oberlahnstein cases. In the London epidemic of 1853 the malady was characterized by extensive pleuritic effusion, with little pulmonary consolidation. In the widespread epidemic in Europe, about the middle of the seventeenth century, convalescence was often delayed by abscesses, especially in the region of the clavicle. Swelling of the joints was present in some of the Middlesborough cases.

In the South-of-England epidemic of 1740-46 the disease was marked by expectoration which was thin, yellowish or bloody, offensive and so acrid as to cause soreness of the pharynx. Profuse sweating and petechia were harbingers of death. In the Urbino epidemic of 1602 the pericardium was very often found full of fetid fluid. In the Phillipsburg epidemic of 1689 the lungs were often gangrenous, and heart-clot was frequent. In the Minster and Loramies epidemics of 1879 multiple cases in infected houses was the rule, delirium was present in almost every case. In the Amberg prison outbreak 161 of 1,150 persons were affected; cases occurring until the walls were scraped and cleaned. In the Peshawar epidemic of 1895 there were 34 cases in a regiment of 573 men, the outbreak continuing until the camp was removed at the end of fifty-three days. It is interesting to note that there occurred a severe epidemic of pneumonia in this regiment at the same place, sixteen years before.

The peculiarities of symptomatology witnessed in epidemics of pneumonia are interesting in the extreme, and it is with regret that I am constrained, by narrowness of scope and lack of time, from entering upon an analysis of these, as reported in the literature.

A FEW REMARKS ON THE PROPER CLEANSING OF A RUNNING EAR.[1]

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THOSE who are connected with a number of institutions, general and special, will agree that the results obtained from their prescribed treatment of running ears vary greatly according to the ability of their subordinates who are intrusted with the carrying out of the treatment. And the writer knows of no one thing of greater prophlactic value than this same ability correctly and thoroughly to do the work prescribed. Many of the complications that frequently attend the course of an ordinary middle ear abscess may be avoided by the tact, courage and knowledge of a capable assistant at the bedside of the patient, and the dangers that surround such a patient are greatly magnified by the employment of an inexact, timid and ignorant attendant, who perfunctorily employs the apparatus appropriate to the case in a half-hearted way. This danger is also increased by the lack of frequent and adequate supervision on the part of the attending physician. We well know that we much more frequently have to deal with a complicating eczema, furunculosis, or mastoiditis in cases nursed at home by a member of the family, under our direction or under that of the family physician. This also holds true when the treatment is done at a general hospital, under the supervision of a house staff, with a very superficial knowledge of the organ and very little opportunity of increasing their knowledge of the diseases treated. Likewise, we more frequently see an acute process become chronic or an otorrhea persistent after a mastoid operation, under like circumstances; whereas, on the contrary, we frequently have the pleasure of seing even an old, foul, running ear become clean, inodorous, quiescent or even healed under the competent ministrations of a nurse in a hospital especially devoted to the treatment of diseases of this organ. The only secret lies in the knowing how, the genius that comes from taking infinite pains.

First, let us consider the necessary steps that confront us when we are about to attend the birth of a running ear, which is to follow the doing of a paracentesis of the drum membrane for an acute middle-ear abscess. If there is any place for asepsis in ear surgery it is just here at the very beginning of our surgical interference. The canal of the ear should never be treated as beyond suspicion, but should be handled as a dangerous criminal lying in wait to do untold harm. Every vestige of cerumen and epithelial débris should first of all be removed by careful syringing and wiping with cotton pledgets and all hairs around the orifice clipped to the surface. The ear canal should then be syringed with a solution of tincture of green soap in water at 110° F., until the skin surface looks perfectly clean. Afterward the canal should be filled to overflowing with 95 per cent. alcohol, which is permitted to soak in for at least five minutes and then allowed to flow out of the ear, without wiping. The canal is then syringed with a solution of bichloride of mercury 1 to 2.000 of sterile water at 110° F.; following this the ear canal is thoroughly dried out with pledgets of sterile cotton or gauze. Meanwhile the necessary instruments, an ear speculum and a sharp-pointed scalpel or bistoury, have been sterilized by boiling in a soda solution. Under good illumination the cut is made in the posterior inferior quadrant of the drum membrane and the extruded fluid and blood carefully wiped out with sterile cotton or gauze. The end of a thin strip of sterile gauze, half an inch wide and a couple of inches

1 Read before the Section on Otology of the New York Academy of Medicine, March 9, 1905.

long is then carried by means of a pair of angular ear forceps just up to the membrane, the strip lying loosely in the canal and the other end lying outside in the concha, which has partaken in the cleansing process. The concha is now loosely packed with gauze and this is covered with absorbent cotton held in place by strips of adhesive plaster.

Subsequent dressings should take place two or three times daily, omitting the syringings, under the same antiseptic precautions. The strips of plaster are easily detached by the use of benzine. In case the discharge is too profuse for this method of treatment, then a change must be made after a trial of twenty-four to forty-eight hours. The writer believes that where adequate drainage up to and through the drum membrane is possible, this method of treatment will bring about a quick and perfect healing, in the majority of cases.

Suppose now that we have to change our methods because of the profuseness of the discharge saturating the dressings and so establishing a channel of further infection from the outside, or that we first see the case after a spontaneous perforation of the drum membrane, how shall we meet the indications? In these acute cases the writer if of the opinion that there are only three necessities within our sphere of action: (1) the removal of the accumulating discharge from the ear canal, (2) the rendering of this canal as little septic as is possible, (3) the administration of systemic remedies with a view to modifying the intensity of the middle-ear inflammation. We certainty cannot hope to introduce any remedy efficiently into the middle-ear cavity, and the benefit to be derived from moist heat by means of syringed fluids is, to say the least, problematical, while the danger of irritating the middle-ear structures by forcible syringing is not to be forgotten.

It is just here that we find our greatest comfort in an able assistant, one who can periodically, at intervals of three or four hours, gently and efficiently irrigate the ear with aseptic water or a weak solution of carbolic acid or bichloride of mercury, etc., according to the preference of the attending surgeon. The solutions should be used at a temperature of from 110° to 120° F., about one quart being used at a sitting. Should the patient complain of dizziness or pain, the temperature or force is to be moderated.

In the opinion of the writer, the most efficient method of douching the ear consists in using an apparatus constructed by attaching to the hard rubber terminal of an Alpha "E" constant flow syringe, made by Parker, Stearns & Sutton, of New York, about two feet of three-eighths-inch soft rubber tubing, the other end of which tubing is supplied with the glass terminal of an ordinary straight medicine dropper. The proximal end of the syringe lies in the bowl or pitcher of aseptic water and the distal end is introduced to just within the orifice of the ear canal and just so much or so little force can be utilized as seems necessary at any step of the proceding without any disturbance of the apparatus or of the patient. The ear can be syringed without disturbing in any way the position which the patient finds most comfortable, nor is it necessary to exert any traction on the auricle, which by the older methods is often the occasion of considerable discomfort to the patient and, in children, of struggling and annoyance. The water, as it comes from the ear, is caught in a pus basin adapted to the patient's shape and held by the patient or an attendant. Good illumination is necessary.

After syringing, the ear canal is thoroughly dried with pledgets of cotton rolled up on a cotton applicator so as to be small but firm in the body, but fluffy on the end which is to be introduced into the ear canal. These pledgets should be two inches long and removed from the applicator before introducing them into the ear canal. They are to be carefully introduced and left in for a couple of minutes; a few should be used at each sitting. Then a wick of gauze should be introduced gently and carefully into the canal without packing and a soft wad of cotton loosely placed in the concha of the auricle. The attending surgeon should see the patient at least once a day to supervise the procedure on the part of the nurse and also to wipe away any little masses of epithelium and to treat any irritation of the skin of the canal or any uncleanly condition of the canal from inspissation of the discharge. As the discharge diminishes and the other symptoms abate, so should the frequency of cleaning the ear decrease.

Right here, the writer feels that a word of caution might not be amiss; peroxide of hydrogen, a favorite remedy with many general practitioners, should never be used, either in solution or in the form of drops in a case of acute middle-ear abscess, its use not being necessary to cleanse the canal and its dangers from increased tension and dissemination of infection, should it attain the middle-ear cavity, being beyond computation. In fact, the use of drops in an acutely running ear is as unnecessary as often unduly hazardous. Inflation of the ear, in these acute cases is also, in the opinion of the writer, a doubtful procedure, except it be done for well grounded and conservative indications, such as the effort to determine the patency of the perforation.

When we come to consider the cleansing of an ear, the seat of a chronic middle-ear abscess, we must be prepared to conform our efforts to the conditions present, and must extend our invasion to the cavity of the middle ear itself. Should the perforation be small but well placed for drainage, at the lower end of the drum membrane, we may succeed in our attempt to cleanse the middle-ear cavity by bringing to our aid inflation, or aspiration, or syringing with a Buck's middle-ear pipette, afterward drying out with cotton on a slender applicator. The appropriate remedies may then be applied hopefully. Peroxide of hydrogen again should not be used in this class of cases for obvious reasons, and remedial drops should be used by instillation or by the pipette only after

thorough cleansing, if any impression is to be made upon the mucous membrane.

If the perforation is small and situated anywhere in the upper half of the drumhead, the writer believes that the chances are against any permanent cure in most cases of chronic abscess, unless the perforation is adequately enlarged downward to the lower edge of the drum-membrane, so as to provide for thorough drainage and cleansing of the tympanum.

A chronic middle-ear abscess with a perforation situated in Shrapnell's membrane demands syringing by means of an especially devised canula, Hartmann's being the best; and this canula can be used in connection with the writer's syringe or with a douche bag suspended above the level of the patient's head. Buck's pipette is too small and lacks force; Blake's middle-ear syringe is objectionable because its canula has a rigid connection with the syringe and the movement of the syringe is transmitted; the bore of the canula is also too small and the quantity of water used so limited that its temperature cannot be controlled. Both instruments, however, are valuable for applying medicated solutions.

All granulations must be attacked and destroyed before an ideal cleansing of the tympanic cavity is possible.

A good-sized perforation of the drumhead simplifies greatly the process of cleansing the tympanum, for we can introduce the Hartmann canula easily, and by rotation send the stream of water in all directions, thus thoroughly flushing out the cavity. We have an adjuvant of great value in the use of weak solutions of adrenalin chloride, which by shrinking the mucous membrane renders all the following steps in the cleansing process easier of attainment. Needless to say, the ear canal should receive the same attention along similar lines as in the acute cases, no matter which of the above conditions obtain.

Cleansing the running ear by means of syringing with watery solutions has the well-known disadvantage of encouraging an edematous condition of the mucous membrane, the development of granulation tissue, an osmotic flow from the blood vessels, and an increase in the secretion from the glandular apparatus. Therefore, it should be our aim to decrease the frequency of syringing and substitute for it dry methods of cleansing in direct proportion to the diminution in quantity and virulence of the discharge. As we progress, the treatment should come more and more into the the hands of the surgeon himself, the cleansing being done personally by him daily or less frequently, as may be indicated; the aim being to dry out the ear canal and the tympanum with as much gentleness and patience as possible, then to apply the remedies used to suit the case in such fashion that only those parts receive the application that need it.

As means to the attainment of this dry form of cleansing, we have the use of the cotton pledgets on or off the applicator, the gauze sponge, the gauze drain, which should always be applied loosely, the use of inflation or aspiration, the various soluble antiseptic powders applied in extremely small quantity just so as to coat the surface, the administration of small and repeated doses of belladonna, and patience—always patience.

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MEDICAL PROGRESS.

SURGERY.

Hand Sterilization.—In carrying out hand sterilization, mechanical and chemical methods are employed. (1) *Mechanical.*—Careful use of a stiff nail brush with soap and hot water removes many bacteria and attaches superficial epidermal cells and grease with contained organisms. The time required and the injurious effect on the hands render it beyond the limit of practicability to produce efficient sterilization by this method alone. (2) *Chemical.*—Ordinary operating-room methods are to a considerable extent inefficacious in rendering the hands sterile. The fact that cultures of the staphylococcus could be obtained from an inoculated silk thread after thirty minutes in a watery solution of corrosive sublimate (1 in 1,000) speaks for the weakness of this popular preparation. Absolute alcohol has but slight germicidal power, but the diluted fluid (70 per cent.) has a far greater action than a watery solution of bichloride or biniodide of mercury (1 in 1,000) or a saturated solution of permanganate of potash. Prolonged use of alcohol, however, will cause pain, roughen the skin and may produce eczema. J. C. WEBSTER (*Am. Jour. Obstet.*, April, 1905) has held that the ideal cleansing agent must be a solution capable of dissolving fatty matter and of penetrating the epidermis, strongly germicidal, rapid in action and non-injurious to the skin. After long experimentations the writer suggests the unpurified clove oil an approach to the ideal. After five minutes' scrubbing with soap and hot water the skin should be dried with a sterile towel and rubbed for one minute with alcohol to remove any remaining moisture. Clove oil is then rubbed into the skin for five minutes and afterward washed off with alcohol. A slight burning sensation may result, but the skin is not injured. The hands should then be covered with dry sterile rubber gloves. Wet gloves macerate the skin, which may readily yield organisms which have not been destroyed through any undetected hole in the glove. The use of various "hand coatings," wax paraffines, rubber solutions are not to be recommended, as they are prone to crack and peel off in long operations.

Method of Uniting Intestines of Very Small or of Unequal Caliber.—J. SHELTON HORSLEY (*Am. Med.*, April 29, 1905) gives a new operation adapted to these conditions. It is impossible to describe the operation satisfactorily without the illustrations. Much of the paper is taken up with experimental work involving the process of repair in intestinal union after suture. The experiments are given in detail, and seem to demonstrate that something more than approximation is needed to secure satisfactory union. A small area of two peritoneal surfaces sutured together was found not to adhere except where there was pressure or some cause besides mere approximation to excite hyperemia of repair. He contends that uniform pressure along the margin of the intestinal wound is necessary, and that this condition is filled by the continuous suture, but not by the interrupted. Photographs of intestines operated upon with casts, showing their caliber at the point of union, are given.

Biliary Drainage in Operations on Gall-Bladder and Biliary Ducts.—EUGENE A. SMITH (*Am. Med.*, April 29, 1905), says, judging by his experience of 40 cases in 90 per cent. of such operations, biliary drainage after operations upon the gall-bladder and biliary tract is wise. We must consider such disease as due to infection and the continuation of the infection with exacerbations and periods of quiescence, and with gall-stones as an accompanying factor and a result of the infection, cholecystitis and cholangitis, not cholelithiasis, must be diagnosed. Early biliary drainage for cholecystitis and cholangitis is urged to prevent alteration of structure in the biliary tract and dangerous complications due to local peritonitis and adhesions with consequent disturbances of nearby viscera of associated digestive function, especially the pancreas. Biliary drainage in the majority of cases is best carried out by cholecystostomy, which is easier and safer than cholecystectomy. The latter is indicated for stricture of the cystic duct, in cases with thickened, distorted, perforated or gangrenous gall-bladder, and when malignancy is suspected or found. Cholecystectomy should be accompanied by drainage of the cystic duct below the point of removal of the gall-bladder. Patients suffering from the toxemia of cholemia long continued, should be offered exploratory operation and biliary drainage by cholecytostomy or cholecystenterostomy. Obstruction of the common duct by stricture and chronic pancreatitis may be thus treated with good hope of cure by this procedure, and in malignancy life is prolonged with comfort. The author describes at some length the technic of his operative work.

The Surgery of the Posterior Mediastinum; Its Past and Its Future.—Operations upon the posterior mediastinum have been looked upon as being of such a serious nature and attended by such a high mortality that surgical technic in this direction has been more or less neglected when compared with the revolution which has given to modern surgery a scope far beyond the dreams of our predecessors. J. D. FAURE (*Bull. Johns Hopkins Hosp.*, April, 1905) reviews the work that has been done upon this subject, and shows the impracticability of thoroughly dealing with affections of the posterior mediastinum by the methods advocated by Rehn, Wassolow, Tuffier, Potarea, etc. The author relates two cases in which he operated by a method of his own, and while he was successful in performing the operations without accident, and even without difficulty, both patients died as a result of unforeseen conditions. The two cases operated upon had a cancerous growth of the esophagus situated behind the bifurcation of the bronchia and the lung.

The author in describing his technic states that other operators limited their resection to three or four ribs in gaining access to the posterior mediastinum. He emphasizes the fact that to see clearly and freely, it is necessary to include the first rib in the costal resection, this being the main step governing the operation. So long as the first rib is intact it is impossible to make an extensive manipulation in the posterior mediastinum, and even if all the other ribs from the second to the eighth, or even the ninth, be removed, the first rib still fixes the shoulder and all the adjacent parts of the chest immovably to the vertebræ column; if, on the contrary, the first rib is resected, or even simply divided, the corresponding half of the chest is immediately loosened from the backbone, while the shoulder is pushed aside to such an extent that it becomes necessary to hold it to avoid wrenching the root of the brachial plexus. The posterior mediastinum then opens like a book, and nothing is easier after detaching the pleura and apex of the lung, than to reach its depths and execute all possible maneuvers. In the author's cases he used the above method, and was able to explore the posterior part of the trachea and bronchia, to dissect the pneumogastric nerve behind the pedicle of the lung, and to make, in short, all the manipulations necessary to success in a complicated operation, such as the extirpation of a part of the thoracic esophagus. This new technic has brought the most difficult operations on the posterior mediastinum within the range of possibility. Only experience can show what the future has in store for them. It is, of course, evident that this class of operations must always be of a serious character, since the life of the patient is at stake, and they are indicated only in cases where all other means of treatment have been tried in vain, and where life is in immediate danger, such as cancer, foreign bodies in the esophagus, or suppurative mediastinitis.

Spinal Anesthesia with Stovaine.—Stovaine, a synthetic product, belonging to the class of anesthetics, is warmly recommended by T. TUFFIER (*Wiener klin. therap. Woch.*, April 9, 1905) as a substitute for cocaine in spinal anesthesia. Five centigrams of the drug in 10 per cent. aqueous solution are generally injected into the dural sac in the usual way. The anesthesia appears somewhat sooner (in four to five minutes) than with cocaine and usually lasts three quarters of an hour. During the operation, bad after-effects were never seen. The patient retains his color, and perspiration, vertigo or nausea, such as are common with cocaine, do not appear. After the operation, the patients feel perfectly well, and often take solid food on the same day. If the cerebrospinal fluid is again aspirated, after the stovaine solution has ben injected, it will appear opalescent, probably because the stovaine has to some degree precipitated in contact with the alkaline fluid. This is the chief reason why the drug is so harmless, for less will reach the centers of the medulla.

Treatment of General Peritonitis.—This subject is carefully considered by BARTH (*Dent. med. Woch.*, March 9, 1905), who believes that gastric lavage is very useful for combating the tympanites and intestinal atony following operation. Before vomiting has begun, the introduction of the stomach tube will reveal the presence in the stomach of a large amount of material regurgitated from the intestines. The return of peristalsis may also be assisted by the performance of enterostomy, which may sometimes be done without any general anesthetic. Through the operative wound it is always possible to reach a loop of gut, which may, if necessary, be stitched to the parietal peritoneum. A puncture of the intestine is then made with a small, fine trocar, to which a rubber tube is connected. This apparatus is held in place by a dressing. When the trocar is removed, the wound in the gut closes and heals without the introduction of any sutures. If the operative wound cannot be used for the purpose, then a small opening may be made in either side of the abdomen. The writer reports eleven cases in which this procedure was adopted and in seven the patient was apparently saved by the operation.

The Toxic Action of Chloroform on the Kidneys.—As the result of an extensive series of experiments carried out in animals, OTTENGELD (*Arch. f. klin. Chir.*, Vol. 75, No. 3) found, that chloroform anesthesis causes a more or less transitory fatty degeneration of the uriniferous tubules of the kidneys. Where the latter organs have been weakened by a specific disease or by some constitutional condition, such as cachexia or arteriosclerosis, this involvement is much more extensive and pronounced. Pregnancy *per se* does not result in

any marked predisposition. Rapidly succeeding anethesias are to be avoided as much as possible. The addition of oxygen in the mixed chloroform-oxygen narcosis, seems to inhibit the toxic action of the chloroform.

Hysterectomy for Fibroids of the Uterus With a Report of 250 Operations.—JOHN B. DEAVER (*Am. Med.*, April 15, 1905) says his experience with uterine fibroids has led him to hold the following opinions: Fibroids of the uterus do not not require removal unless they are productive of symptoms, but that when they do become symptom-producing, they should be removed promptly, before the patient has been weakened by toxemia, hemorrhage, or sepsis. Abdominal supravaginal hysterectomy is the operation to be preferred in the vast majority of cases. Myomectomy is applicable only to younger women in whom the tumors are few in number and superitoneal in character. Panhysterectomy is to be employed only when intraligamentary growths, whether uterine or ovarian, render the performance of supravaginal amputation difficult or dangerous. The ovaries, or a part of one ovary should be preserved in every woman who has not reached the age of the menopause, unless they are distinctly and indisputably diseased, or unless their retention would needlessly prolong and complicate the operation.

When to Perform Myringotomy and the Mastoid Operation.—E. AMBERG (*Med. Rec.*, April 15, 1905) cites a large number of authorities, the consensus of whose opinion seems to be that early incision of the drum membrane and early operation in mastoiditis are the courses of election. The author divides the cases of acute mastoiditis into three groups: (1) Those which take a rapid course, clearly showing alarming local and general symptoms, especially of a toxemic character, and which do not respond to palliative measures. (2) Those which take a somewhat more protracted course, extending over a period of one or several weeks, exhibiting plain local symptoms, but which are not accompanied by intense pain nor by a grave affection of the whole system, and which, at least temporarily, respond to palliative measures. (3) Those which take a mild course. The first type should be called mastoiditis acutissima; the second, mastoiditis acuta; the third, mastoiditis subacuta. In general, when deciding whether to operate or not to operate in a case of mastoiditis we had better err to the safe side and open the mastoid. We can never come too early under any consideration, but we may in some cases miss the right time and be too late if we hesitate. An antrotomy in acute mastoiditis can be compared to a myringotomy in acute suppurative otitis media.

MEDICINE.

Adaptation and Tuberculosis.—J. G. ADAMI (*Am. Med.*, April 29, 1905) emphasizes the fact that in infectious diseases in general, while the bacteria grow more particularly in one organ or tissue the successful counteraction of the disease is not a local matter. In fact, the tissues of the infected organ are so injured that they cannot themselves play any very active part. The counteraction is by the rest of the organism; in part by the leucocytes developed in the bone marrow and elsewhere, in part by other tissues, which discharge into the blood diffusible antitoxic and bactericidal substances. He calls attention particularly to the recent observations of Wright and Douglas that the phagocytic activity of the leucocytes is not called into play to any extent unless the blood serum contains certain substances which activate the leucocytes. These substances appear to be developed apart from the leucocytes, that is to say, by other tissues of the body. Applying these considerations to tuberculosis, he points out that when the tubercle bacilli grow locally there is a slow diffusion out of their toxins; and it is by the adaptation of the rest of the tissues to these toxins that the leucocytes and these other tissues become accustomed to produce diffusible antibacterial substances. In favorable cases these are present in amounts so considerable that the local growth of the tubercle bacilli is arrested and healing tends to ensue. Post-mortem observations show that this arrest is the rule rather than the exception. Applying these considerations to the treatment of tuberculosis, he shows first, that the tuberculin treatment is but an attempt to carry out the natural process; that tuberculin is merely a concentrated extract of the toxins of the bacilli, and these now are injected into the organism at a distance from the site of local growth of the bacilli. Their action must be to stimulate the cells of the rest of the organism, and to produce increased amounts of antibacterial substances. The cells, however, may be in a state of low vitality so that they do not react, and hence this treatment is by no means constantly successful. Modern treatment similarly, he points out, is a carrying forward of the same idea. The disease as such is felt severely alone, every attempt is made to improve the general tone of the organism by rest, good food, and fresh air. The cells gain improved tone and respond to the toxins, producing increased quantities of the antitoxic and antibacterial substances. Here, again, it is the body as a whole and not the local reaction that brings about arrest of the tuberculous process. The adaptive processes on the part of the bacilli are next considered. These also are capable of being modified according to alterations in their environment, so that by passage they are found to adapt themselves more and more to the organism of any particular species. By passage through the organism of one species the bacilli become more and more virulent for that species, and thus may become less adapted to growing the organism of another species. Dr. Adami is of the opinion that this is the case in general, and with tubercle bacilli grown in the human bovine organisms respectively in particular.

Cerebrospinal Fever.—J. C. WILSON (*Journal A. M. A.*, April 29) reviews the history, causes, symptoms, treatment, etc., of epidemic cerebrospinal meningitis, a disease which has at present a special interest on account of the lately occurring epidemic in New England and in New York. While it has been recognized for about a century, most of our knowledge of the disorder has been acquired of late years, and largely through the work of our countrymen, Councilman, Mallory and Wright. Councilman's recent paper (*Journal A. M. A.*, April 1, 1905) is referred to by Wilson. Formerly the communicability of cerebrospinal meningitis was doubted, but it is now admitted that if the nose, ears or lungs are affected, it may readily be conveyed from one person to another. Second attacks are very rare; it is probable that one attack confers a persistent immunity. The germs are found only in connection with the lesions of the disease, but mixed infections are not uncommon. The symptoms are most diverse, there are no prodomes, and the period of incubation is unknown. In the malignant cases the symptoms of inflammatory lesions of the brain and cord and those of a general malignant infection are both overwhelming. The author goes at some length into the description of the general symptoms and those of the anomalous types, the fulminant form, the abortive, the intermittent and the chronic types. Few diseases vary more in their severity and mortality, or are followed by more complications. The

diagnosis may be difficult, but if meningitis be present, it is not usually embarrassing during an epidemic. In doubtful cases lumbar puncture should be resorted to, and the presence of the meningococcus in the cerebrospinal fluid ascertained. The differential diagnosis between this form and tuberculous meningitis may, in some cases, be far from easy without this. The mortality of different epidemics varies between 20 and 75 per cent.; the average is estimated by Wilson as near 40 per cent. In the mildest cases no treatment is required; in the malignant ones none is effective. Quiet, nutritious diet, cold applications to the head and spine, laxative doses of calomel in the beginning of the attack and opium are recommended, the last-named drug being regarded as indispensable. For prophylaxis, cleanliness and avoidance of overcrowding in times of epidemics, isolation and sterilization measures, and in case of successive attacks in the same family, abandonment of the dwelling and thorough disinfection are advised.

Treatment of Gonorrheal Arthritis by Hyperemia.—JOHANNES VON TILING (*Journal A. M. A.*, April 29) has secured excellent results from Bier's method of damming back the circulation with elastic bands in several painful cases of gonorheal arthritis. He advises the use of a thin, pliant rubber bandage, applied so as not to cause discomfort, but sufficient to produce very perceptible hyperemia. Blueness and coldness of the limb, white or vermilion spots and pain or paresthesia indicate that the bandage is too tight and should be loosened. Properly applied, the most marked first effect is relief of pain, but this is not all; damming, he claims, has a bactericidal effect, and dissolves away the adhesions which are completely removed by massage after the removal of the bandage. At first the bandaging should be of short duration, a few hours at a time, but later it should be increased until it reaches ten hours a day and ten hours at night. After removal of the bandage, massage lightly, then have the patient stand and move the joints. He claims that this method gives better results in most cases of gonorrheal arthritis tending to stiffness of the joints than any other.

Experimental Researches on Renal Dropsy.—It has been assumed that the production of dropsy in renal disease is due to the retention of solid materials in which renal insufficiency is the main factor. Particular importance in this connection has been ascribed to the chlorides, but P. F. RICHTER (*Berl. klin. Woch.*, April 3, 1905) believes that dropsy and insufficient excretion of sodium chloride are not dependent one on the other, and the association is by no means constant. Experiments were carried out in rabbits, and it was found that the administration of uranium nitrate was followed by condition of acute nephritis accompanied by transudation of fluid into the serous cavities and edema of the skin. Both of these conditions were dependent upon the simultaneous administration of large quantities of water. When in other animals, sodium chloride was added to the water, no greater increase in the amount of fluid was noted. Experiments with milk and mineral waters, containing different percentages of salts, also showed that it was not the salts, but the quantity of fluid which was responsible for the production of the transudates. These facts have an important bearing on the question of renal dropsy, particularly as regards its prevention and treatment in the acute forms of the disease. The regulation of the amount of fluid to be given is therefore of the greatest importance in making up the dietary. Whether the increased ingestion of fluid has any effect on the heart in bringing about a muscular insufficiency, as is claimed by many writers, need not be discussed here, but the author believes that his experiments have demonstrated that the ingestion of an abundance of fluid does not produce a flushing of the system, together with a removal of the waste products, nor does it relieve the inactivity of the kidney. It seems more probable that the water remains in the system and induces a tendency to the production of a nephritis. This also applies to the exclusive milk diet advocated in acute nephritis and the administration of mineral waters. In the dietetic treatment of nephritis, these points deserve more attention, as it appears, than the sodium chloride content of the food and the osmottic changes dependent upon it.

Action of Roentgen Rays on Normal Blood.—A large number of healthy animals were exposed by E. HELBER and P. LINSER (*Münch. med. Woch.*, April 11, 1905) to the prolonged action of the Roentgen rays, with the following results: The first change noticed is a diminution of the number of leucocytes. In small animals, such as rats, the blood will be entirely free from white cells after an exposure of five to ten hours; in rabbits seventy hours or more will be necessary, while dogs will always retain a small percentage. Some of the animals were killed soon after exposure; but no retention of leucocytes was found in the internal organs. If the exposure was continued, the leucocytes reappear or increase again in number for some time until the hematopoietic system is entirely exhausted, and a final drop is the result. The lymphocytes seem to be especially sensitive to the action of the rays, and their nuclei soon lose the power of taking up specific dyes. All these changes were observed, even after the spleen had been extirpated. The red cells were affected much later, and then only the changes of a simple anemia are observed. The number of blood-platelets did not undergo any changes, even when no leucocytes were present, hence it is improbable that they are derived from the latter. At autopsy, very few changes were found in the internal organs, except in the kidneys, which almost always gave evidence of acute nephritis. Ulceration of the skin or loss of hair was not seen, probably since the animals were allowed a certain freedom of motion, and the action of the rays was not concentrated upon one portion of the body.

Imitation of Biological Action of Light Rays.—If lecithin is exposed to the action of the Roentgen or radium rays, it will become decomposed, so that it will no longer be harmless if injected into the tissues of animals. Strangely enough, R. WERNER (*Münch. med. Woch.*, April 11, 1905) found that the changes induced by this altered lecithin are exactly the same as are noticed after exposure to the Roentgen or radium rays (dermatitis, necrosis of the skin). The same effects may be obtained by digesting lecithin with pepsin, or by ozonizing it. Cholestearin, oleic acid and other substances may be substituted for the lecithin. Experiments are being conducted to determine if the therapeutic effects of the Roentgen or radium rays may be imitated by these altered chemical bodies.

Observations on Pneumonia.—A study of autopsy records tends to suggest that in the majority of cases pneumonia is a general disease, while in a smaller number of cases the process is localized in the lung. D. E. KEEFE (*Boston Med. Jour.*, March 30, 1905) considers the presence of the pneumococcus in the blood as significant of failure on part of the organism to localize the infection in the lung, and an indication of the presence of excessively virulent organisms or low individual resistance, a condition which increases the gravity of the prognosis. Early leucocytosis is the rule in this disease. Cases of low leucocyte count ending in recovery may be explained by assuming the imprisonment of the

micro-organisms in the lung, the disease remaining virtually a local process. Absence of leucocytosis in the early period of the disease signifies a large dosage of virulent organisms overwhelming the patient's resistance, and is of unfavorable prognosis. The following treatment is suggested by the writer. Patients should lie on the sound side, supported with pillows, thus favoring the emptying of the vessels of the diseased lung by gravitation. Ice is applied to the affected side. This treatment may be augmented by wet or dry cups or leeches, and the use of counterirritants over the affected lung. Medicinally veratrum viride is of value to bleed the lungs into the abdominal veins and general capillaries. In the latter part of the second or third stage digitalis, ammonia, or whisky may be beneficial. Plenty of fresh air should be admitted, but the body covering should be sufficient to promote perspiration and dilatation of the superficial capillaries.

New Method of Testing Functional Power of Stomach.—The study of the functional power of the stomach has been greatly hampered by the fact that the only method in use is expression after a test meal has been given. This procedure is not only time-consuming, but actually fails in a large number of cases where the tube cannot be passed into the stomach properly. For this reason, SAHLI (*Corresp. f. Schweiz. Aerzt.*, April 15, 1905) has devised a very simple method which merely requires an examination of the urine or saliva. It is a well known fact that connective tissue is readily dissolved in the stomach, but not only the pancreatic juice. If a small amount of iodoform or methylene by enclosed in a sac of goldbeater's skin, which is almost pure connective tissue obtained from the intestines of cattle, the small bag will only be dissolved in the stomach, if sufficient acid and pepsine are secreted. By testing the saliva for iodine, and by observing the first appearance of green urine, a good idea can be obtained of the amount of acid and pepsine present. Later experiments have convinced the author that the goldbeater's skin of the market is not sufficiently uniform in thickness, so that he now encloses the pill of idioform or methylene blue in a small bag of thin dental rubber, which is tied off by a thread of thin non-sterilized catgut. The latter is also dissolved only in the stomach in the presence of gastric juice, and never in the intestines. The amount of iodoform employed is one decigram of methylene blue, five centigrams. Other dyes or chemicals are not suited for the test.

OBSTETRICS AND GYNECOLOGY.

Uterine Hemorrhage After Extraction of Teeth.—The connection between menstruation and the condition of the teeth has been observed and commented upon by both gynecologists and dental surgeons. It is a well-known fact that the gums swell and bleed easily during the menstrual period. ANOUFRIEFF (*Roussky Vrach*, Feb. 26, 1905) reports the case of a married woman of twenty-five, who suffered from profuse and repeated memorrhagia after the extraction of six roots, the loss of blood causing acute anemia, and even serious apprehensions as to the patient's ultimate recovery. It may be noticed here, en passant, that the author obtained the best results from a solution of adrenalin as a hemostatic. Toothache is said by some authors to frequently foretell the approach of the menstrual period; in some women bleeding from the gums at stated intervals may serve as vicarious menstruation, and it is of the utmost importance for the dentist and the surgeon to remember that odontalgia may in a woman simply denote the approach of menstruation, and not caries of the bone or irritation of the gums. The gynecologist should dissuade his patients, especially those who suffer from endometritis, from having their teeth extracted immediately before or after or during menstruation, and the dentist should refuse operative interference, especially as odontalgias may be controlled locally for a certain length of time.

Etiology of Eclampsia.—A very important observation, which may settle the etiology of eclampsia, has been made by W. LIEPMANN (*Münch. med. Woch.*, April 11, 1905). Normal placenta, when injected intraperitoneally into rabbits is usually not followed by any reaction, but if the placenta of an eclamptic patient is substituted the animals almost always die. Very soon after injection, the respirations become hurried; death sets in with the animals in the sitting position, and usually without the appearance of convulsions. It makes no difference if the solution employed is recent or several days old. It is very likely that the eclamptic poison comes from the placenta, the metabolism of which is altered in some unknown way. If it is possible to immunize rabbits against this toxin the serum treatment of eclampsia may yet prove successful.

Extra-Uterine Pregnancy with a Fully-Developed Fetus.—Among the comparatively infrequent cases of extra-uterine pregnancy those with a fully grown fetus are rather rare, and the case reported by MICHIN (*Roussky Vrach*, March 26, 1905) presents so much more interest. The patient, a woman of thirty-eight years, a 4-pasa, presented herself at the clinic with undoubted symptoms of extra-uterine pregnancy of seven months' duration. As the pregnancy entered upon the second half, and was not accompanied by any urgent symptoms the patient was advised to abstain from surgical interference as long as possible so that a live child might then be extracted. Patient was placed under the charge of the hospital attendants, and at the expiration of seven weeks, when she complained of very severe abdominal pains, great difficulty in urination and defecation and inability to stay even in bed, was operated on. The incision over the linea alba struck the placenta and brought on a severe hemorrhage. The entire operation lasted three-quarters of an hour, and the patient stood it well. The uterus was the size of a three to four months pregnancy, its adnexa were not in any way implicated in the process. The postoperative course was normal and uneventful. The stitches were removed on the twelfth day, and the patient left the hospital six weeks after the operation. The extracted fetus was alive (and remained so), and weighed 2,420 grms.; length of body 42 cm.; circumference of head 31.5 cm.

The Bacillus Aerogenes Capsulatus in Puerperal Infection.—The part played by the *Bacillus aerogenes capsulatus* in the production of puerperal infection is recorded by H. M. LITTLE (in the *Johns Hopkins Hosp. Bull.*, April, 1905) based upon a study of ten cases. This organism was first isolated in a case of puerperal fever by Dobbin in 1897, and was considered by him to be the true etiological factor in the infection. His observation has been abundantly confirmed by observers in France and Germany, who described the organism under various names, all of which, however, are undoubtedly identical with the bacillus of Welch and Nuttall. Some of the names under which this organism has been described are as follows: (1) *Vibrion septique;* (2) *Bacillus phlegmones emphysematosæ;* (3) *Bacillus perfringes;* (4) *Bacillus emphysematis vaginæ;* (5) *The Granulobacillus saccharobutyricus immobilis liquefaciens;* (6) *Bacillus aerogenes aerophilis agilis;* and (7) *Bacillus septique aerobie.* The introduction into the pregnant or puerperal uterus may give rise to one or more of the following conditions: (1) emphysema of

the fetus; (2) puerperal endometritis; (3) physometra; (4) emphysema of uterine wall; (5) gas sepsis. The *Bacillus aerogenes capsulatus* may gain access to the uterine cavity in one of two ways. The first and by far the more usual, is its introduction by means of the examining finger or by instruments. By reason of its almost invariable presence in the feces of human beings, this is particularly liable to occur in spontaneous labor when the perineum and vulvar regions are insufficiently cleansed, as well as in operative cases in spite of this care. In the second place they may be present in the circulating blood, by which they are carried to the uterus, and then be cultivated from the lochial discharge. In the ten cases reported by the author seven followed operative procedures, and an eighth self-inflicted abortions. All of these had been repeatedly examined. In one case, however, which entered the hospital profoundly infected, the patient stated that she had not been examined vaginally. The organisms cultivated from this patient were obligate anerobes, and this was one of the cases in which the infection evidently took place through intestinal ulcers which were found on autopsy. The ideal treatment in these cases of infection is, of course, prophylactic, and this can be attained best by careful aseptic technic during labor. Should fever ensue during the puerperium the treatment should be along the following lines: (1) Removal of necrotic material offering a medium for growth of organisms; (2) establishment of free drainage from the uterus, and (3) stimulation of the natural resistance of the patient. The greater danger to be feared is the passage of the organisms from the uterus into the circulating blood. While patients with *Streptococcus septicæmia* not infrequently recover, all known instances of gas sepsis have ended fatally. If the infection be grave and definitely localized in the uterus, hysterectomy is justifiable, but theoretically, only when the infection is on the point of becoming generalized.

A Case of Tubal Pregnancy in Connection with Cancer of the Uterine Cervix.—There occur cases of extra-uterine pregnancy that are diagnosed accidentally while operating for some other condition. Thus POKROVSKY reports (*Roussky Vrach*, March 26, 1905) the case of a peasant woman of twenty-six years, who first complained of uterine hemorrhage and pain in the lower abdomen. Examination elicited cancer of the cervix, for which a complete hysterectomy was advised. The uterus and the left tube and ovary were removed in their entirety, while the right tube was found to contain a two-months old placenta, but the fetus could not be found. Both ovaries had undergone cystic degeneration, and presented a pathological picture of circumscribed chronic interstitial oophoritis due to syphilis or gonorrhea, in this case to the former, as was elicited from the patient's past history (infected by the husband and had five premature births). The post-operative course was, with few exceptions, comparatively uneventful and the patient was discharged cured. It is unfortunate that the author did not examine microscopically the findings in the right tube, but he makes his diagnosis of pregnancy first by exclusion and secondly because he found old blood coagula, among which there was a piece of more organized tissue, a break in the wall of the bag pointing to an increased pressure in the cavity, and loose coagula in the peritoneal cavity that evidently escaped from the ruptured tube. In addition there were sudden pains and hemorrhages from the uterus, which might be ascribed to rupture of the pregnant bag, with consequent escape of blood into the peritoneal cavity and the placenta; there thus occurred partial separation of the placenta from the uterine wall, a disturbance in the nutrition of the fetus and its consequent death; the fetus was evidently disintegrated and absorbed. As regards the cancerous process, its beginning must very likely be referred to a period of some two to six months before thte patient became really sick, although patient states that she had suffered from some indefinite pains some seven years ago. The case presents the very interesting feature of a combination of two serious maladies, either of which by itself might have eventuated fatally, but from both of which the woman's life was saved by timely surgical interference.

Breast Feeding for Infants.—A valuable contribution to the efforts now made to diminish infant mortality by insisting on the mother nursing her own child whenever possible, has been published by G. MARTIN (*Archiv f. Gyn.*, Vol. 74, No. 3), and is based on a series of 11,000 cases at the Maternity Hospital in Stuttgart. The mother's milk agrees with almost all infants, and not even a wet nurse is an efficient substitute. The indications against nursing should be restricted as much as possible, and in many cases the inability to nurse is only apparent and will not withstand serious criticism. The influence of nursing on the proper involution of the internal genitals is especially valuable in those women who may be compelled to take up manual labor after only a brief interval spent in bed. In the institution where the observations were made, it was found possible to increase the number of nursing mothers so that from 98 per cent. to 100 per cent. of the women were able to satisfy their children. Of the breast-fed babies, 40.9 per cent. reached their birth-weight on the eighth day, and 54.8 per cent. on the thirteenth day of the puerperium, while 25.4 per cent. of the bottle babies only reached their birth-weight on the eighth day, and 35.6 per cent. on the thirteenth day. An unfavorable effect of nursing on other diseases was never observed—in cardiac disturbances, the compensatory disturbances usually subsided, and in renal troubles, the albumin disappeared. These patients are, moreover, protected for a longer period from subsequent pregnancies, and the latter exert a much more debilitating influence than the nursing. Syphilis is not considered by the author to constitute a contra-indication, if a shield is employed. He claims that the so-called psychical reasons for inability to nurse are merely unproven theories, and the secretion is entirely dependent on the stimuli which are exerted on the milk glands. Among the most marked reflex stimuli are the suckling efforts of the child, and the latter may prove sufficient to cause a return of the milk secretion even when this may have been interrupted for a period of several weeks or months. A mother must show a desire and inclination to nurse her child, and this is one of the most important factors. A determined effort should be made on the part of the profession to instil these thoughts into the minds of parents and nurses. If the baby is given the breast early and the efforts continued, the milk will appear with certainty in most cases.

EYE, EAR, NOSE AND THROAT.

Results of Magnet Operations.—Since the X-ray has become such a potent factor in localizing the foreign metallic bodies in the eye, a great deal of attention has been devoted to the magnetic method of removing them. Unfortunately, however, although a great many of these cases have been done, it is difficult to find records which deal with the after-conditions, especially in reference to sight. LESLIE BUCHANAN (*Lancet*, January 14, 1905) reports the history of three cases in which metal chips have been

removed by the electromagnet. He concludes that what may be called useful vision may remain after the removal of a metallic chip from the eye. It is necessary that the extraction should be done as soon as possible after the injury. The utmost care must be taken that the point of the magnet is sterile, and it is essential that all forms of recognized ophthalmic and medical treatment should be used subsequent to the operation for the prevention of iritis and other destructive changes.

Bepold's Variety of Mastoid Disease, Complicating Diabetes Mellitus.—S. MacCuen Smith (*Am. Med.*, February 11, 1905), from a careful study of the literature and his own cases concludes (1) aural complications of diabetes mellitus may originate primarily in the mastoid cells; (2) the process may be manifested by the classic mastoid symptoms without involving the tympanic cavity; (3) this condition is peculiar to diabetes mellitus; (4) the term "diabetic ear" should be limited to those cases in which the disease begins as a primary osteitis of the mastoid, or in which primary tympanic involvement and rapid mastoid complications seem simultaneous; (5) while he believes it is advisable to reduce the amount of sugar when possible, in those cases showing an excessive glycosuria, unless the urgency of the local symptoms would demand immediate operation, he has not met any cases that terminated in what could be call postoperative coma.

Cataract, Choice of Operation.—S. D. Risley (*Am. Med.*, February 18, 1905) asserts that intraocular diseases, the result of prolonged eyestrain, or as a local manifestation of some general dyscrasia, *e.g.*, gout, rheumatism or diabetes, is not infrequently the cause of impaired nutrition of the crystalline lens and vitreous body, leading to opacity of the former and liquefaction of the latter. In these cases there is also great tendency to involvement of the posterior capsule of the lens and the contiguous cortex, *i.e.*, posterior polar cataract. Therefore cataract, even in aged people, should not be regarded only as an evidence of senility but as one phase of a pathologic process, a view which is enforced by the consideration that its occurrence is exceptional even in advanced age. Dr. Risley urges that a recognition of these complicating pathological states is important, both from the point of view of prognosis and the choice of operative procedure. He thinks that attempted extraction without iridectomy is not advisable in these eyes as the pupil is rigid and the lens not readily delivered. He advises preliminary tridectomy, to be followed by extraction a month or more afterward. A choice can then be made between extraction of the lens in its capsule, in which case a Kalt stitch should be employed, or by the more usual method which usually requires a third operation, a capsulotomy to secure an opening through the opaque posterior capsule, which should be done with two suitable capsulotomy knives, in order to avoid traction upon the ciliary region.

X-ray Therapy in Trachoma.—Some two to three years ago Mayou, Cassidy, Rayne and others reported favorable results in the treatment of trachoma with Roentgen rays. Vassintinsky (*Roussky Vrach*, January 8, 1905) bases his experience on the observation of seven cases from which he draws the following conclusions: (1) The effect of the X-ray therapy on the trachomatous process is beyond doubt, as evidenced by the decrease of the infiltration, the disappearance of the granules and the pannus, and a marked improvement of the subjective painful sensations. (2) It can be stated in a general way that the trachomatous granulations tend toward slow disappearance under the influence of radiotherapy; its influence on the infiltration is more marked; pannus is very favorably affected by the method of treatment. (3) The author is unable to report a single case of complete care of the trachoma, notwithstanding the great number of sittings, as well as their length. He thinks, however, that this may be due to some other causes, such, for instance, as frequent interruptions, the consistence of the tubes, which exert a certain effect on the power of the rays as emanating from the radiogenous tubes. (4) The tendency of the tissues to cicatrization was rather insignificant under this line of treatment. (5) As compared with other methods of treating trachoma (the expression of the granules, etc.), X-ray therapy is rather less effective in the form of trachoma unattended with deep infiltration (the so-called follicular conjunctivitis). (6) The author failed to observe any harmful results from radiotherapy either directly to the eye, or in the form of any dermatites. (7) Radiotherapy is entirely painless. (8) Those cases of trachoma which are not amenable to the ordinary method of treatment or which proved to be unyielding to same, are beneficially influenced by the X-ray treatment, and should be subjected to it. Finsen's method is as yet sub judice in ophthalmological practice. As regards trachoma, some authors recommend the ultraviolet rays as obtained from various sources, but the results can not as yet be given with any positiveness.

PRESCRIPTION HINTS.

Treatment of Hiccough.—Hiccough is a phenomenon not always easy to determine the cause and frequently difficult to cure. Professor Robin, in one of his clinical lectures, cites the case of a man who came into the hospital three times for this affection. Anti-spasmodics were employed, but they seem to have rather accentuated the spasms. A closer examination revealed that the patient suffered for some time from dyspepsia, which was probably the exciting cause. Mr. Robin prescribed consequently, and with success, five drops, four times a day, of the following mixture:

℞ Picrotoxin ..... gr. i
Proof spirit ..... q.s.
Hydroch. of morphine ..... gr. i
Sulph. of atropine ..... 1/8 gr.
Ergotine ..... gr. xv
Cherry laurel water ..... 3 iii

And the following powder:

℞ Calcined magnesia ..... gr. xxx
Bicarb. of soda ..... gr. xx
Lactose ..... gr. xx
Codeine ..... 1/8 gr.
Subnitrate of bismuth ..... gr. xv
Chalk ..... gr. xv

For one powder, three daily.

At the end of two days of the treatment, the patient left the hospital cured.

Acute Coryza.—This troublesome affection is frequently rapidly alleviated by the following powder:

℞ Salicylate of soda ..... ʒ ss
Dover's powder ..... gr. xxx
Essence of peppermint ..... ♏ xi

Divide into 10 powders. One every three hours until relief is obtained.

Warts.—

℞ Salicylic acid ..... gr. xxx
Resorcin ..... gr. xxx
Elastic collodion 3iv

Paint on the wart every night for a week.

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OF MEDICAL SCIENCE.

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SATURDAY, MAY 20, 1905.

THE NEW STATE COMMISSIONER OF HEALTH.

THE recent appointment of Dr. Eugene H. Porter, of New York City, to the post of Commissioner of Health of New York State, produced some additional flurry of interest because of the fact that the new head of the Health Board is a homeopath.

As we pointed out, in our editorial in the MEDICAL NEWS, on the celebration of the Sesquicentennial of Hahnemann, there is at the present time very little difference between the education given the medical students in homeopathic colleges as compared with those of the regular school, the difference, indeed, being almost absolutely confined to the department of pharmaceutics. With regard to sanitary science and public hygiene, the opportunities afforded by both schools are practically the same, and in these subjects the State examination required for licensure consists of the same set of questions. There seems to be no doubt, then, that the health of the State will be quite as efficiently cared for as it has in the past, and that there shall be no necessary cause for complaint because of any difference of principles with regard to the prophylaxis of disease.

With regard to differences between schools of medicine, it seems only proper to recall what Governor Pennypacker, of Pennsylvania, said recently in vetoing the osteopath bill, which had passed both houses of the legislature and came up for his signature. He calls the bill an anomaly in our legislation because it would legalize the limitation of the use of any method of treatment for the cure of disease. The whole idea of different schools of medicine, he says, is unscientific, and everyone engaged in the treatment of the sick should seek the truth wherever it may be found and utilize it. This opinion represents the ideas of all thinking men at the present moment, and there is no room left now for differences of opinion that may keep those who are suffering from any form of treatment which could possibly be of benefit to them. The sooner there is a universal consensus of opinion that any form of treatment which promises to do good will be welcomed by all practitioners of medicine, without regard to the method of their education, the sooner will real progress in the cure of disease become effective.

The efficiency of a State Commission of Health is indeed very largely a personal matter, and depends on how seriously the occupant of the position takes his duties. There are opportunities in the present condition of public health in New York State for excellent work that shall prove of great importance in lessening suffering and reducing mortality outside of the large cities. Typhoid fever has well been said to be a rural rather than an urban disease, and there is room for improvement in the health conditions of the rural communities of New York State with regard to this affection. It must not be forgotten, too, that any improvement in mortality in this matter will also be reflected in the death-rate from typhoid fever in the cities. For with all possible care, the water supply of the crowded centers of population is almost sure to become contaminated to some extent, if typhoid fever is allowed to rage improperly cared for in rural communities.

Besides this has become an age of summer flitting, and at least one-half of the inhabitants of our larger towns consider it necessary to spend some weeks, and indeed in many cases some months in the country during the heated term. Not a few of the cases of typhoid fever that are reported in our large cities, especially in the fall of the year, are among persons who have returned from their vacations with the germs of this disease already in their systems. Owing to

occasional failure of recognition in these cases sufficiently early, sometimes other individuals become affected, and there is a constant element of danger from this source. It must not be forgotten that the autumn represents the most frequent incidence of typhoid fever, and that not a little of the contagion can be traced in one way or another to country districts.

We would recommend these considerations to the attention of the new Commissioner of Health and suggest that he can accomplish much both for the health of the community and for the standing of the school of medicine to which he belongs, by faithful fulfilment of duties which are not nearly so facile of accomplishment as is sometimes imagined, and cannot be done effectively by any mere routine. There is no doubt that he will receive all due cooperation from the members of the regular school of medicine in this work, and that in the high purpose of maintaining and ameliorating the health of our people, there shall be no petty jealousy, to interfere with coordination of effort.

A SUGGESTION TO THE "CONFERENCE ON HOSPITAL NEEDS."

How much of public and private means and efforts are bestowed on the hospitals of New York City, is in part revealed by the tables prepared for the information of the conference called by the New York Association for Improving the Condition of the Poor, to consider "Hospital Needs and Hospital Finances." In old New York alone (Manhattan and the Bronx) there are sixty-one hospitals of recognized standing, including twenty-nine general hospitals, fifteen hospitals for women and children, and seventeen miscellaneous special hospitals.

At the first meeting of the conference a committee was appointed to consider the means of placing existing institutions on a sounder financial footing. The financial problem is serious and is not to be underrated; and yet, when the conference shall have concluded its deliberations, the hospitals of the city very likely will go on as they have always done, seeking support each from the particular group in the community among which it has been organized, and will continue to gauge their plans by the amount of support obtained or promised.

Another opportunity, a golden opportunity for public service, lies directly in the path of the conference; namely, the opportunity to study and to exhibit to the community the wide gaps in hospital organization which mar the charitable work of the city—which leave sanitarians perplexed and a whole class of sufferers unprovided for. To study and classify these deficiencies and to show how existing needs can be met is a task which should appeal strongly to those who have organized the conference. The question to be considered is whether beds already founded should be redistributed in such manner as to take in the now neglected classes, or whether, in lieu of such redistribution, new institutions should be established. In this connection an enumeration of wholly or partially neglected classes of cases may be of interest.

It needs but a word of reminder to recall the thousands of cases of tuberculosis in all its forms and stages, cases curable and incurable, whose fate is bound up with the welfare of the community and for which adequate provision is lacking.

A second class, which is excluded under existing rules from all the private hospitals of the city, consists of patients suffering from mental diseases. The need of mental wards, as distinguished from asylums for the permanent care of the insane, has found recognition in Europe and recently in this country, in Albany. The reasons given for the establishment of the mental wards of the Albany General Hospital will, in the main, apply with equal force to New York City. These wards were established "(1) for the transient accommodation of insane patients committed to a State institution, and (2) of patients who need observation before the advisability of commitment to a State or other institution is determined; (3) for mild cases of insanity who may recover in a general hospital; (4) for victims of drug addiction; (5) as an emergency resort for rapidly developing and critical cases of delirium; and (6) for the sudden and often dangerous forms of mental disorder which occur in the course of general diseases or after the shock of surgical operations or anesthesia."

Among the prosperous dwellers in crowded hotels and apartment houses in New York City cases of contagious disease occasionally develop, and many of these cases seek in vain for suitable hospital accommodations. A patient who is able to pay for a private room and for attendance can be received at the Minturn Hospital if suffering from diphtheria or scarlatina, but a measles patient is rejected even here. Erysipelas cases also are almost universally declined.

For cases of measles the Health Department has at its disposal a mere handful of beds on North Brothers Island, and for erysipelas cases there are male and female wards at Bellevue. These limited and comparatively poor accommodations signify the absolute exclusion of the well-to-do, and necessitate the rejection and consequent neglect of a majority of the cases occurring among the poor.

Chronic and incurable cases of every description receive scant consideration at most of the hospitals, and the effort to exclude such cases is hardly to be condemned under existing conditions. More beds are needed for hopeless cases of malignant disease, and an almost uncultivated field awaits some generous founder of a home for patients with incurable nervous disorders.

Whenever medical men assemble to consider means of combating the further spread of venereal diseases, the crying need of additional hospital accommodations is emphasized. In most of the hospitals of New York these socially dangerous maladies are looked upon with dread, and in the absence of complications constituting an immediate menace to life, the treatment of such cases in ward beds is usually refused.

Add to the cases already cited the thousands of helpless "convalescents" who are thrust from the doors of hospitals to make room for acute cases, and one begins to realize the magnitude and complexity of the work which remains to be done before New York City can boast of anything approaching a comprehensive system for the care of those who are proper subjects for hospital treatment. As an initial step in the development of such a system, the conference of hospital representatives should be organized as a permanent body. It is to be hoped that such organization will be effected and that at least a portion of the energies of this representative body will be spent in the consideration of the problems just outlined.

TWENTIETH ANNUAL MEETING OF THE ASSOCIATION OF AMERICAN PHYSICIANS.

THIS year the twentieth annual meeting of the Association of American Physicians, held, as usual, in Washington, was as well attended and as replete with scientific interest as any of the past sessions. The discussions in the present meeting were even of more practical character than usual, as may be seen in the abstract from the proceedings published in this week's MEDICAL NEWS, p. 955. Subjects of special interest to the general practitioner of medicine were almost constantly on the tapis, and not so much time as usual was given to pathological discussions or to the presentation of rare cases that are interesting curiosities, but whose study can be, after all, of but little help to the physician busy with the routine of ordinary practice.

The increase in the number of members who may now be admitted to the Association, which was accomplished last year, and the creation this year of a class of associate members limited to 25 in number, but with all the ordinary privileges of active members, will probably serve still further to add to the interest of the proceedings in the future, since younger workers are to be thus given the opportunity to bring their researches before the Association. There has, however, always been a noteworthy readiness on the part of the Association of American Physicians to encourage the young men in their investigations, and nothing ever evokes so much applause as a difficult technical study well elaborated and rendered clearer by one of the juniors.

The distinctive features of the present meeting were undoubtedly the discussions on gonorrheal septicemia and endocarditis, on the occurrence of fever associated with chronic endocarditis, and on the retention of the chlorides in cases of chronic parenchymatous nephritis. As the result of the investigations made at Johns Hopkins there can no longer be any doubt that gonorrhea may be the active cause of the most serious general symptoms without the presence of any notable local lesions. Most of these cases have been mistaken for other and usually much more benign affections. In one case, described by Dr. Thayer, there was apparently a complete clinical picture of typhoid fever. As Dr. Osler said, the temperature chart appeared absolutely typical of typhoid. Even spots simulating the rose spots of typhoid fever had been noted. On the twenty-first day, however, when the diagnosis of typhoid was about reached, the gonococci in pure culture were found in the blood. We are tempted to wonder how many of the cases of so-called typhoid fever without Widal reaction, but with a clinical history that is supposed to make them unmistakable, are really examples of gonorrheal septicemia masquerading under the guise of typhoid fever. The fact that Dr. Thayer's case recovered completely after seven weeks only makes this possibility more proximate.

With regard to fever associated with chronic endocarditis there can be no reasonable doubt, after the discussion, that it may occur without any other cause than the process on the heart valves. The vegetative form of chronic endocarditis seems to be most often thus complicated by fever, but the valve lesions are by no means necessarily of large size. Some of them indeed are rather inconspicuous. This low grade fever bears no relation to malignant or ulcerative endocarditis and is not complicated by thrombi and other active manifestations. The cases last many months as a rule and are often fatal, though this is not an absolute rule.

The whole subject of the place of common salt in the human economy was brought up in the discussion of its relation to the edema of nephritis. In parenchymatous nephritis the abstraction of salt from the diet in many cases brings about an immediate reduction in the patient's weight, which reduction is due to the disappearance of the water from edematous tissues. The whole process is as follows: Degenerate kidneys fail to eliminate salt which accumulates in the tissues. After a time this attracts and retains water. When salt is not allowed in the food some of the salt previously deposited in the tissues is reabsorbed into the active circulation and it carries with it the water of edema. There seems no doubt that a distinct step in the therapeutics of nephritis has thus been made, though it is clear that much still remains to be learned as to the place and disposal of salt in the economy. The curious observation that a kidney that is only slightly permeable to common salt may yet retain its normal permeability to such substances as methylene blue and the phosphates of nervous metabolism shows how specific are kidney reactions, and how complex is the problem of the physiology of these important organs. These discussions deserve to be read carefully by all those who are interested in these very practical questions and the hints at their solution which are thus afforded.

ECHOES AND NEWS.

NEW YORK.

Hospital Appointments.—The following is the list from the College of Physicians and Surgeons for the past two weeks: *Westchester County*, first, H. A. Keune. *Bayonne City*, L. Cohen. *Christ's* (Jersey City), S. W. Dodd, H. A. Bonynge. *St. Mark's*, T. L. Hein, J. A. Keller. *Elisabeth General* (N. J.), J. H. Childs. *St. Joseph's* (Phila.), A. H. Harrigan. *Swedish* (Brooklyn), first, H. F. Bruning. *Norwegian* (Brooklyn), first, H. G. Baumgard, J. B. Latta. *Orange Memorial* (N. J.), C. L. Allers.

New Home for Crippled Children.—A large mansion, surrounded by spacious grounds, three miles from the town of Hudson, has been donated by Mr. and Mrs. Charles Thorley, of 647 Madison Avenue, to the Free Industrial School for Crippled Children. It was bought from the Alonzo Black estate. The place is to be called the Lulu Thorley Lyons Home for Crippled and Delicate Children, the name being in memory of Mrs. Wallace Foster Lyons. The school and home are to be absolutely non-sectarian. The regular public course of study will be given in kindergarten, primary and grammar classes. Manual training will be a special feature. The donor wishes that the institution educate the children to be self-supporting. Many of the older children will receive a certain sum of money for the work they do.

Women Get Their M.D.'s.—The New York Medical College and Hospital for Women had its commencement last week in the ballroom of the Waldorf-Astoria Hotel. Nine graduates received diplomas, and the following prizes were awarded: Faculty prizes for general excellence, Mrs. Jean M. Williams, of New York, first, $50; Miss Bertha F. Johnson, second, $25; Miss Grace Kahrs, of the sophomore class, for the highest freshman average, $125; Miss Eleanor Van Buskirk, prize for the best two years' work in anatomy; Miss Ethel Delinsky, Dr. Wilcox's prize; Miss Van de Mar, Dr. Boynton's prize in ophthalmology. Addresses were made by Dr. M. Belle Brown, dean of the faculty; Dr. Jenny de Ia M. Lozier, and the Rev. Phoebe A. Hanaford. There was music incidental to the proceedings by the Rubinstein Club, of which William R. Chapman is the director.

Care of Destitute Children.—The State Board of Charities on May 10 sent to 1,200 superintendents and overseers of the poor throughout the State copies of the new law passed by the last legislature to prevent evils and abuses in connection with the placing out of destitute children, together with the new blanks to be used by poor officials in making reports. Under the statute such reports must be sent to the department every month. The old law required only annual reports. The principal changes in the questions which superintendents and overseers must answer have to do with the religion of the child's parents, and of the family with which the child is placed, and are designed to insure the enforcement of the following section in the law: In every case where practicable any child placed out shall be placed with individuals of like religious faith as the parents of the child.

Graduation Exercises at Homeopathic.—The forty-first annual commencement exercises of the New York Homeopathic Medical College and Hospital were held May 9 in Mendelssohn Hall. Twenty-one students were graduated and received hospital appointments. The vicar of Trinity Church, the Rev. J. N. Steele, delivered the graduating address. The prizes for general excellence in study were won by Harry Clinton Sayre, of Warwick, N. Y., and David Clark Strachan, of East Orange, N. J., while the Fiske Prize for the highest standing in the studies of all classes was won by Ralston R. Reed, of the junior class. Addresses on subjects of interest and instruction to the graduates were delivered at the Flower Hospital earlier in the day by Dr. Charles Francis Adams and Dr. St. Clair Smith. A demonstration in surgery was given by Dr. Nathaniel Robinson, class of '85.

Class Reunion.—The Class of 1895 of Medical Department of New York University held a class reunion and banquet at Hotel St. Regis, May 9, to celebrate the

tenth anniversary of graduation. Fifty-six of the ninety-seven members of the class were present. Dr. Eben Foskett presided, and speeches were made by Prof. John F. Brady, of Yonkers, N. Y.; Dr. Wm. J. Nary, John F. Coums, of New York; H. L. Buled, of Camden, N. Y.; Carl V. Reynolds, of Asheville, N. C.; T. B. R. Smith, of Jeanette, Pa., A. P. Bergman, of New Haven; T. J. Kilmartin, of Waterbury, Conn.; F. C. Adams, of Bridgeport; E. T. Thorpe, of Derby, Conn., and others. Although reunions of medical college classes are unusual, this was a great success, as an unusual spirit of friendship has always been present among the members of this class. It is worthy of note that 95 of the 97 surviving members of the class are engaged in medical work. Four members of the class have passed away, two of them of tuberculosis.

Polyclinic Needs Funds.—The *Times* supports the Polyclinic in its appeal for funds in an editorial, which says: We published some time ago a communication from Dr. John A. Wyeth with reference to the kind of work, and its value, done at the Polyclinic Medical School. That institution is now in need of a new building, and appeals to the wealthy men of New York to aid it. We think the appeal is worthy of most careful consideration, and that an examination of the purpose and methods of the school will strongly justify it. The essential aim of the school is the practical teaching of the art of preventing and healing disease not merely through theoretic instruction, but, in addition, through the actual observation of cases in hospital and dispensary practice. It is the aim that has been pursued with such intelligence and success at Johns Hopkins in the system of which Dr. Osler is the eminent advocate, and of which he is to undertake the establishment in the University of Oxford. In our city, though there is provision for excellent medical instruction, his system is not adopted in a degree at all proportioned to the needs of the community. Dr. Wyeth and his associates have been working nearly a quarter of a century with singular devotion and unselfishness to extend the system. It is certainly a sound one, and we commend to it candid and friendly study by the philanthropic.

St. Mark's Hospital.—In a report just issued by the board of managers of St. Mark's Hospital, at 177-179 Second Avenue, it is pointed out that the institution is one which "has never refused admission even to hopeless cases." Comparing the work of St. Mark's with that of other hospitals, the report continues: In looking over the latest published reports of hospitals in Manhattan and Bronx it is seen that the salaries amount in some cases to 33 per cent., and even over 40 per cent., of the total expenditures, and the cost of maintenance of a ward patient is as high as $2.48 per day, and of a private room patient as high as $5.49. The daily cost of a patient in St. Mark's Hospital, taking into account all current expenses, is $1.80, whereas the average daily receipts from a patient are less than eighty-five cents. The most notable improvements during the last year were the establishment of a private obstetrical free ward, the registration of the St. Mark's Hospital Training School for Nurses by the regents of the University of New York, and the establishment of a night service in the out-door department to enable those sick poor who cannot leave their home or work in daytime to obtain medical aid and treatment. One of the charitable features of the hospital is the rule to give a free meal to any poor person applying at the door, and 3,814 meals were supplied in this way during the last year. In the same time 4,109 patients were treated.

Health of the Port.—The Consulting Board of the Health Officer of the Port of New York, consisting of Drs. J. D. Bryant, E. G. Janeway, H. M. Briggs, G. L. Peabody, F. P. Kinnicutt, J. H. Girdner, J. W. McLane, R. H. Derby, Wm. M. Polk, J. W. Brannan and T. M. Prudden, visited the Quarantine on Saturday, May 13, making a careful inspection of the Station, hospitals and laboratory. The Board passed a formal resolution of approval of the high standard of efficiency which is maintained by Dr. Doty in the administration of this important agency in the protection of the public health. The Consulting Board believes that the administration of Dr. Doty is especially noteworthy and admirable in the following features: In the practical recognition of the fact that it is in the infected man and his immediate surroundings that danger lies, and not in the ship or its cargo or its healthy passengers: in the systematic use of the clinical thermometer for the detection of early and obscure phases of infection; in the application of scientific sanitary measures adapted to each special form of infectious disease; in liberal and humane efforts to ameliorate the hardships of necessary quarantine detention; and, finally, in the unwearied efforts, through laboratory research and experiment, to add to the knowledge of useful, practical sanitation. The members of the Board who for many years have been conversant with the conduct of the New York Quarantine, expressed their cordial appreciation of the effective way in which each advance in the science and practice of modern sanitation has been at once applied to the complex problems of this great port, so that year by year, through new measures which Dr. Doty has himself devised and tested, or has made available from other sources, the country is more effectively protected against the entrance of communicable and other infectious disease, while at the same time there is a steady reduction of the annoyances to individuals and damage to commerce in which earlier quarantine systems were constantly involved.

Funds at Roosevelt Inadequate.—According to the thirty-third annual report of Roosevelt Hospital, the phenomenal growth of the surgical department, with other causes of increasing expenditure, compelled the hospital board early in the year to close a ward of twenty-eight beds, in the effort to bring the expenditures of the year within the income. The report reads: The result has been that heroic efforts have been made to afford relief with the restricted capacity, and the close of the year would have shown a deficit of $8,893.19, if it had not been for the fact that three generous friends contributed the amount required to wipe out the deficit. If to that sum were added the amount of $33,964.48, already alluded to as expended by a member of your board in necessary betterment, the deficit would have aggregated $42,857.67. In the light of these figures, may not attention again be called to the need of increased endowment in the sum of $500,000, which is really the minimum sum required to produce a revenue which will be sufficient to maintain the hospital in its present line of work? The sum expended for current support of the hospital, $179,573.56, was $11,172.11 less than that of the previous year. The decreased cost per capita for food as compared with the previous year was 1 1-6 cents, the expense of food for each inmate having been 35 1-3 cents, as against 36½ cents the previous year. These figures represent the cost of food supplies before preparation. The number of patients treated in the wards without cost to the individual during 1904 was 3,093, as against 2,807 the previous year. The number of ward patients was 3,875, as against 3,457. As only 782 paid for any part of their board, the percentage of entirely free patients was 79 4-5. The total number of patients under treatment, 4,236, was 380 larger than the year before. So crowded has the hospital been that it was obliged during the year to turn

away 1,474 persons who applied for admission. In regard to recent betterments, the report says: The necessity for economy, in which your board had set an example, early in the year, by closing a ward of twenty-eight beds, would have made many much-desired improvements impossible of realization had it not been for the assistance to that end given by a member of your board who enlisted the helpfulness of esteemed friends to the degree that secured for the hospital betterments involving an outlay which aggregated $33,964.48, and among which were the following: The construction of a new laundry and its equipment with electrically operated machinery; the establishment of a new storeroom; the substitution of electric power for steam in the operation of two elevators, and enclosing the westerly half of the hospital block with a brick wall. The hospital affords exceptional advantages for the education of nurses, and offers opportunities for a thorough and varied practical experience in the medical, surgical, gynecological and children's wards; also in the general and gynecological operating rooms, the emergency department, a three months' course in obstetrical nursing at the Sloane Maternity Hospital, and a course in dietetics and massage. Class recitations and practical demonstrations are given throughout the year. In addition, there is a regular course of lectures by the visiting physicians and surgeons. The full course of instruction covers a period of three years.

PHILADELPHIA.

Florence Nightingale Receives Congratulations.—The nurses of the Jefferson Hospital Training School sent their greetings to Florence Nightingale on her eighty-fifth birthday.

Aid for the Presbyterian Hospital.—The Devon Home of the Presbyterian Hospital, at Devon, held a strawberry festival last Saturday afternoon, the proceeds of which will go to the hospital named.

Smallpox Attacks Prisoners.—This disease made its appearance among the prisoners of Blair County jail, which contains some sixty inmates. The State Board of Health has quarantined the place, and has ordered that no prisoners be admitted until the disease is conquered.

Hospital Reports.—In the Kensington Hospital for Women 70 patients were treated while in the dispensary; 286 were treated during the month of April. The Mt. Sinai, during the same period, treated 3,306. Of this number 1,100 were surgical cases, 702 were eye cases, 395 were medical and 278 were children.

Typhoid on the Decrease.—Last week 155 new cases were reported in contrast to 256 of the preceding week. The Twenty-first and Twenty-second wards, which receive filtered water, are credited with seven cases only; the five wards supplied with water pumped directly from the Delaware River reported 92 out of the 155 cases.

The Harrisburg Catastrophe Taxes Hospital.—The injured and the dying victims of the wreck taken to the Harrisburg Hospital so filled that institution that patients were forced to occupy chairs and benches in order to make room for those seriously injured. Physicians and the nurses were kept busy, and toward noon of the day following the accident, they had used the supplies in the hospital, making it necessary to call upon the citizens to come to the assistance of the hospital with supplies.

Philadelphia County Medical Society.—At a regular meeting of this society, which was held May 10, Dr. M. H. Fussell read a paper and presented specimens of "Two Cases of Malignant Endocarditis." This paper was discussed by Dr. Gwyn. The next paper was read by Dr. Norman B. Gwyn upon "Typhoid Fever, Accidental Infection with the Bacillus of Malignant Edema or the Gas Bacillus; Death with Symptoms of Intrathoracic Irritation." Dr. G. B. Massey read the last paper, "The Present Aspect of the Cancer Problem."

Philadelphia Pathological Society.—At a regular meeting of this society, which was held May 11, Dr. W. E. Robertson read a paper entitled, "Sarcoma of the Lung." Dr. W. T. Longcope read a paper on "Thoracic Infection in Tuberculosis." Drs. L. Pearson and S. H. Gilliland presented a paper on "Additional Experiments upon the Immunization of Cattle Against Tuberculosis." Dr. R. C. Rosenberger read of "A Study of the Mesenteric Glands, especially in Relation to Tuberculosis." The last paper was presented by Dr. H. R. Alberger on "Anthracosis of the Liver in Pulmonary Tuberculosis."

Lived Four Days Without Water.—After completing their task of loading a car of cabbage, six negroes of Charleston, W. Va., laid down in the car and fell asleep, and while asleep the car was locked and started on its journey north. When they awoke they found themselves prisoners and regarded the affair as a joke, but as the train continued without stopping, and after they found themselves without any food or drink the matter became serious. As the door of the car opened in Philadelphia, the six men were found stretched on the floor nearly dead. After water was supplied they soon recovered. Each sufferer had given up all hope of recovery.

The Establishment of an Infant Asylum Proposed.—In her annual report, Mrs. Belle S. Cohen, president of the Jewish Maternity Association, advocated the founding of an institution to care for infants in connection with the Maternity Hospital. During the last year 263 patients were cared for in the wards; 150 children were born in the hospital, this number includes 6 pairs of twins, 30 of the children were placed in the Nursery for Motherless Infants. In the dispensary 1,087 cases were treated. According to the treasurer's report the receips were $7,491.57, of this amount $6,000 was received 1rom the Federation of Jewish Charities; the expenditures were $9,751.65, leaving a deficit of $2,260.08. At the same meeting officers were elected.

Appropriations Cut and Bill Vetoed.—In signing the appropriation bills passed by the legislature during the last session, the Governor reduced the total amount appropriated $866,120. He vetoed the act creating a Department of State Charitable Institutions which provides for a commissioner with a salary of $10,000, and a number of assistants. In giving his reasons for the veto he said that the purpose of the bill and the system elaborated in it would in all probability be of benefit to the Commonwealth, and would enable the Governor and the General Assembly to secure important information concerning the institutions which the State supports or to which it makes appropriations, but there is no provision in the bill for intrusting the work to the Board of Public Charities or for the repeal of the act creating the board, consequently conflicting reports would be received from the Board of Public Charities and from the Commissioner of the Department of State Charitable Institutions.

Tropical Diseases.—On Thursday, May 11, the students of Jefferson Medical College listened to a lecture delivered by Dr. F. M. Sandwith, formerly of Cairo, Egypt, but now professor of medicine in the School of Tropical Medicine, London, on the *Distoma hematobium* (*Bilharzia*). He informed the students that this disease of Egypt, South Africa, and occasionally of Asia. The male is about 1 cm. in length while the female

is longer and thinner, and many inhabit the gynecophoric canal of the male. He differentiated the distoma of Egypt from the one found in Asia by the fact that the male of the former is covered with tubercles while the Asiatic male hematobium has no tubercles. The female is not capable of locomotion. The eggs of the parasite are like a melon seed, each having a spike either at the end or upon its lateral surface. These spikes are a means by which the eggs wander from place to place, and they are also a source of irritation, which causes the bladder, where they are frequently found, to contract, and this procedure often forces the eggs into the soft structures of the bladder wall. In speaking of the portal of entry he mentioned the mouth, but stated that the parasite was destroyed by the normal secretion of the stomach, he also mentioned the urethra and the rectum as portals of entry, but since the parasite is so often found in the neighborhood of the liver he thought this route is less frequently than inoculation through the skin. The peasants are more frequently affected than city people; in regard to the period of incubation he said little is known but may be from two to four months. The principal symptom is hematuria, and if the rectum is the seat of disease the condition similates dysentery, but pain and fever are absent. When the bladder is the part affected by mucosa is thickened, it presents polypi and sand patches, which are collections of eggs of the parasite; the ureter may become greatly dilated and thickened, hydro- or pyonephrosis may develop with atrophic changes in the kidney. When the rectum is the seat of disease there is present ulceration and excrescences of the mucosa; the submucosa is greatly thickened. The vagina may show a similar condition. The anemia is not marked; the red cells number about 4,000,000; the eosinophiles may reach 10 or even 40 per cent. The disease may be complicated by uremia incident to the cystitis and condition of the ureter and the kidney.

Text of Governor's Veto of Osteopathic Bill.—Your Committee on Medical Legislation, appointed at the last meeting of the Philadelphia County Medical Society, has the honor to make the following report on the work done at Harrisburg. Your committee found two medical bills before the legislature, both vitally affecting, directly and indirectly, the medical profession of our State. The first was a bill known as the Hoke Bill, which consisted of amendments to the law of 1893, and the second a bill legalizing a so-called system of medicine, termed "Osteopathy," and regulating the practice of and licensing Osteopaths. Through the united efforts of your Committee the Hoke Bill passed both Houses of the legislature by an almost unanimous vote. Notwithstanding, our efforts, the Governor vetoed the bill, on account of some technical inaccuracies. Twice was the Osteopathic Bill defeated in the House, but by strong political efforts the bill finally passed. The Senate passed it on original and final readings. This enabled the bill to be brought before the Governor for his signature or veto. Your Committee found it necessary to use every effort to prevent the measure from becoming a law. The committee had an appointment with Governor Pennypacker, April 21, to hear the discussion on the Osteopathic Bill. Beside your Committee there were present, the President of the State Medical Society, Dr. König; President of the Allegheny County Medical Society, Dr. Heckel; Dean Holland; Representatives from the Dauphin County Medical Society, from the Homeopathic Medical Societies and the Osteopaths. This discussion lasted for more than three hours. However, the committee report with great satisfaction, that his Excellency, Governor Pennypacker, vetoed the Osteopathic Bill in the following language: "I file, herewith, in the office of the Secretary of the Commonwealth, with my objections, Senate Bill No. 115, entitled 'An Act to regulate the practice of and licensing of osteopaths in the State of Pennsylvania, the establishment of a board of osteopathic examiners representing the Pennsylvania Osteopathic Association and providing for the punishment of persons violating the provisions of this act.' The purpose of this bill is to establish a State Board of osteopathic examiners, to consist of five members to be appointed by the Governor. This board is directed to issue certificates of qualification of practise osteopathy to all applicants having a diploma from a legally recognized and regularly incorporated college of osteopathy. It further provides that licenses shall be issued to all persons who have practised osteopathy in the State for four years prior to July 1, 1905, and to such persons as now legally hold a diploma from a reputable and legally conducted college of osteopathy. It further provides that the applicants after July 1, 1905, shall have attended for at least three separate years such a college of osteopathy, and shall be examined by the board in certain designated branches, and that those who apply after July 1, 1907, shall in like manner have studied for four separate years and submit to such examination.

"Section 7 provides that 'any person who shall practise or attempt to practise osteopathy in treating diseases . . . without having first obtained the license herein provided for . . . shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than one hundred dollars or by imprisonment in the county jail for a period of not more than ninety days for each offense.'

"There is nothing in the bill to indicate what constitutes the science of osteopathy. An effort to solve the query by an examination of the printed literature of the science is not very successful. Dr. A. T. Still, who is the founder of the science and is still living, in his autobiography, says, 'Who discovered osteopathy? Twenty-four years ago, the 22d day of next June, at ten o'clock, I say a small light in the horizon of truth. It was put in my hand, as I understood it, by the God of nature. That light bore on its face the inscription: This is my medical library, surgery and obstetrics. This is my book with all directions, instructions, doses, sizes, and quantities to be used in all cases of sickness and birth, the beginning of man: in childhood, youth and declining days. I am something of what people call "Inspired." . . . The other classes have different names for it—clairvoyancy and clairaudient. Sometimes I was so clairvoyant that I could see my father twenty miles from home: I could see him very plainly cutting a switch for my brother Jim and I, if we hadn't done a good day's work. That is called clairvoyance. Then I could hear him say: "If you don't plow faster I will tan you twice a week." This is clairaudience.' In his Philosophy of Osteopathy, he says: 'Principles to an Osteopath means a perfect plan and specification to build in form a house, an engine, a man, a world, or anything for an object or purpose. To comprehend this engine of life of man which is so constructed with all conveniences for which it was made, it is necessary to constantly keep the plan and specification before the mind, and in the mind, to such a degree that there is no lack of knowledge of the bearings and uses of all parts.' However true this may be, it is too indefinite to give the ordinary layman any very accurate description of the science. Since the bill refers to other schools for the practice of medicine, it is probably a school and it appears from section five that the holders of certificates are not to prescribe or use drugs or operative surgery. The main re-

liance would appear to be upon the manipulation of muscles and nerves, but this conclusion is entirely an inference and may be incorrect. It must be assumed, however, that there is some scientific truth which those interested in osteopathy have discovered, and that it is utilized in the treatment of diseases. The study of medicine and surgery has been conducted for ages, and we have much legislation which is applicable to its conduct. Under the Act of May 18, 1893, a Medical Council was established which issues licenses after examinations authorizing the applicants to practise medicine and surgery. If then osteopathy represents some truth in the treatment of disease, the knowledge and use of which would be beneficial to the diseased and the injured, with what consistency can these practitioners be prevented from making such use of it? Why should their patients be deprived of such benefit as may result from the discovery? If, however, this bill should become a law, the physician who would practise or attempt to practise what the osteopaths have discovered would be punishable by imprisonment for ninety days. This would be possibly a great loss to the community and certainly a great wrong to the physicians. The whole thought of the establishment of schools of medicine is unscientific. All of those engaged in such pursuit ought to be seeking to ascertain the truth and to accept it wherever it may be found. The approval of this bill would appear to give the authority of the State to a system of practice in the healing art which excludes the use of medicine and the use of surgery. Why should there be an attempt to so confine the operations of the mind? If both drugs and surgery are useless they may be rejected, but if they should at times be found to be beneficial why should any science for the enforcement of a theory make the effort to exclude their use?

"Should the bill become a law licenses would be issued by the State Board of Osteopathic Examiners and not by the Medical Council of Pennsylvania, which would be an anomaly in our legislation upon the subject.

"For these reasons the bill is not approved."

CHICAGO.

Antitoxin Bill Passed.—To provide each County of the State with a supply of antitoxin, distributed through an agent appointed by the State Board of Health was the object of the House Bill which passed in the Senate a day or two ago. The bill previously had passed the House.

Cerebrospinal Fever.—During the month 27 deaths reported as caused by cerebrospinal fever were investigated by the Department experts. Only four of these were verified as contagious meningitis, and two of these were ill upon their arrival in this city, having contracted the disease elsewhere—one in New York State and one on shipboard.

Osteopath Bill Defeated.—The Committee on Judiciary of the House of Representatives, Illinois, gave a hearing on Senate Bill No. 311 May 4. Drs. Wm. A. Evans, Robert B. Preble, Geo. W. Webster, Wm. K. Newcomb, C. B. Johnson, M. G. Reynolds, and James A. Egan spoke for the defeat of the bill. The committee ordered that the bill be sent out with the recommendation that it be not passed, and on the following day the bill was tabled in the House of Representatives.

Memorial Institute for Infectious Diseases to Manufacture Sera.—This institute has established a serum division as a branch of its scientific and experimental work. It will undertake the preparation of various curative and protective sera, and will also prosecute investigation into some of the problems of immunity and serumtherapy. It is also thought that a limited amount of diphtheria antitoxin will be available for distribution at cost. Preparations for the new work are now under way, and Professor E. O. Jordan, of the University of Chicago, has been placed in charge of the serum division.

Tuberculosis Bill.—Illinois will adopt the scientific treatment of tuberculosis advocated by her most prominent physicians. It is said that Governor Deneen will sign the bill finally agreed upon between the House and Senate, and which has been passed. The appropriation for a tuberculosis sanitarium originally provided for in the bill was $50,000, but after passing the House the bill encountered opposition in the Senate. Finally, after the Governor had shown active interest in the bill, it was amended to reduce the appropriation to $25,000, and it passed the Senate. The House concurred in this amendment by a vote of 112 to 0.

GENERAL.

Fighting Plague and Cholera.—The Reichstag reassembled May 10, after the Easter recess, and passed the first and second readings of the bill approving the international sanitary agreement, signed in Paris, December 3, 1903, for fighting the plague and cholera. The United States is also a signatory to this agreement.

The World's Largest Hospital.—Under the above caption *The Globe* prints an interesting editorial: "The consumption sanitarium which is to be established near Las Vegas, New Mexico, through the joint generosity of the Santa Fé Railroad and the fraternal organizations, will represent the most ambitious attempt yet made to stay 'the white plague.' The undertaking is of national importance. A mere outline of the plan carries hope to thousands and is a welcome assurance against future misery."

Study Tuberculosis Among Negroes.—Plans to reduce the very high death rate from tuberculosis among the negroes was recently discussed at a conference held in the United Charities Building. The conditions of city life which bring about the abnormally high death rate among these people were discussed. Dr. Andrew H. Smith, former president of the Academy of Medicine, presided at the conference, and Dr. Hermann M. Biggs, chief medical officer of the Department of Health, made the principal address.

A Fire at Brown University.—Zoological and anatomical specimens of considerable value were destroyed by a fire which started in the exhibition section of Rhode Island Hall at Brown University, early May 12. The flames were extinguished in time to prevent extensive damage to the building, and students carried out many valuable instruments and other property. Some of the specimens destroyed cannot be replaced. The fire is thought to have started from a sterilizer, heated by gas, in the basement. The loss to the building itself will not exceed $1,000.

The Panama Situation.—The dreaded appearance of yellow fever on the Isthmus of Panama is regarded in official quarters as likely to hinder progress during the summer on canal work. A telegram received at the War Department from Governor Davis, at Panama, stated that Robert R. West, Deputy Auditor for the Canal Commission; N. M. Barrett, and Charles Leach of the Engineer Department, were down with the fever and in the hospital. The inefficiency of the plans and work done by the former commission in pushing sanitation of the canal zone is becoming daily more apparent. Secretary Taft and the new commission are making every effort to provide against epidemic conditions and to secure protection for the thousands of men who soon will be employed. The new patients are of a class of employees

regarded as intelligent and competent to observe all rules of hygiene and to follow closely the well-established methods of protection against the fever. Recent reports from the Isthmus show that conditions are abnormal, owing to almost a water famine and to bad weather. It is believed that the conditions will improve steadily, and that the American colony is going through its worst experience. Within a few weeks the new water supply system, bringing pure mountain water into Panama, will be in operation. When the city is paved with vitrified brick and sewered it will be the cleanest city in the tropics. This is a consummation devoutly to be wished.

State Board Statistics.—In the issue of last week the Journal of the *American Medical Association* published a very complete and interesting table of the results of examinations held by various medical examining boards throughout the United States. The New York has been worked out from the table:

There are ten colleges represented by graduates between the years 1900 to 1904 inclusive; all of whom took the 1904 tests. The Albany Medical presented 46 men, 4.3 per cent of whom failed; the College of Physicians and Surgeons 221, 3.2 per cent. of whom failed; Cornell 67, with 1.5 per cent.; the Eclectic 9, with no failures; Long Island College 48, with 2.1 per cent.; N. Y. Homeopathic 28, with 3.6 per cent.; N. Y. Medical College and Hospital for Women 9, with no failures; University and Bellevue 58, with 1.7 per cent; Syracuse 34, with no failures; and the University of Buffalo 41, with 6.8 per cent. of failures. Six of the ten colleges are in New York, viz.: Physicians and Surgeons, Eclectic, New York Homeopathic, New York Medical for Women, and Bellevue. Of these the Eclectic, Women's College tie for first place, Cornell is second, Bellevue third, Physicians and Surgeons fourth, and the New York Homeopathic last. Of all the institutions the Eclectic, Women's and Syracuse are first in the matter of having no failures, while the University of Buffalo shows the highest percentage of rejected applicants. The *Journal* ventures the hope that a comparison of the records in different States may do something toward bringing about the much-to-be-desired reciprocity in the requirement for State license.

Boston Society.—A clinical meeting was held in the Treadwell Library at the Massachusetts General Hospital, Friday, May 12. Dr. James J. Mumford presided. Dr. R. C. Cabot gave a preliminary report on some "Studies of Abdominal Tumors" in the Massachusetts General Hospital from 1870 to the present time. He had at present 4,141 cases. These he had carefully arranged and classified, omiting only tumors formed by appendicitis and hernia. In many cases the results were surprising and the evidence to be finally collected will doubtless be of a very valuable character.

Dr. J. T. Bowen demonstrated one case of elephantiasis of the entire left leg, due to lupus vulgaris, and another case of ringworm of the large-spored variety on a cattle-herder from Vermont. He spoke of the etiology and clinical varieties of this condition as it occurs in cattle.

Dr. W. C. Quimby spoke on "End Results in Patella Fractures." Letters had been sent to 50 cases, 30 of which had shown up at the hospital. In the 6 cases, unsutured, a perfect or fair result, at least with a serviceable knee was found in 66.5 per cent; in 26 sutured cases a good result was obtained in 84.5 per cent. In one case, a refracture, with a present separation of several centimeters, the patient held the world's record for three successive broad jumps, 41 feet 5 inches. As regards suture material, the best results seem to have been obtained from silk-worm gut, and the least desirable from silver wire.

Dr. W. W. Zannett demonstrated a case of Charcot joint of the right ankle and a beginning softening of the left. The X-ray photographs were especially interesting.

Dr. C. W. Townsend and Dr. Oscar Richardson reported an unusual case of acute tuberculosis in an infant. A healthy child, good family history, had a continuous fever, 103° to 106° F., for five weeks with absolutely nothing in the physical examination of the most minute description to account for it except a serious discharge from one ear which soon stopped. At autopsy the abdominal cavity was practically obliterated with a caseous mass surrounding intestines and peritoneum, in places one-half inch thick of a tuberculous character. The source of infection is still a mystery.

Indecent Advertising.—The Massachusetts Senate last week by a vote of 17 to 14, passed to be engrossed the bill to prohibit indecent publications, including advertisements, adopting Senator Cummings' amendment, whereby the following bill was substituted for the original measure reported by the judiciary committee: Whoever publishes, delivers, distributes, or causes to be distributed, an advertisement or notice describing the symptoms or details of a venereal disease or of a disease, infirmity or condition of the sexual organs, or an advertisement or notice calling attention to a person, or persons, office, or place, where such diseases, infirmities or conditions may be treated, or where advice relating thereto is or may be given, shall be punished by imprisonment for not more than six months or by fine of not less than $50 nor more than $500 or by both such fine and imprisonment; provided, however, that this statute shall not be construed to apply to didactic or scientific treatises upon the diseases, infirmities or conditions hereinbefore mentioned, which treatises do not advertise or call attention to a person or persons, office or place where such diseases or conditions are or may be treated or where advice is or may be given relating thereto; and, provided, further, that the prohibitions of the statute shall not be deemed to apply to labels securely attached and adhering to bottles or packages of medicine, nor to the printing and delivering in sealed packages outside of this commonwealth of books, pamphlets or circulars containing such advertisements. Senator Craig, of Essex, first moved an amendment to provide that whoever shall advertise to treat or cure venereal diseases, or any owner or manager of a publication in which such advertisement shall be printed, shall be liable to a fine of $500, or imprisonment of from one to six months.

Senator Cummings, of Norfolk, opposed the adoption of this amendment, claiming that it killed the intent of the bill reported by the judiciary committee, which was more drastic.

Senator Clark, of Middlesex, favoring the original bill, exhibited several circulars and advertising pamphlets of the class the legislation was intended to prohibit.

Senator Craig opposed the original bill. He contended that medical and scientific journals and agricultural reports would be completely blacklisted by such a measure. There is law enough on the statute books at the present time, he said. "The federal statutes cover this matter quite fully," said Senator Craig. "If it is passed, it will make the State law on the subject ridiculous."

The Craig amendment was rejected, and the Cummings amendment adopted. Senator Lane, of Boston, then moved to refer the matter to the next General Court. Reference was refused, 17 to 14, and the bill was then passed to be engrossed by a similar vote.

American Gynecological Society.—The thirtieth annual meeting of this society will be held at Niagara

Falls, May 25, 26 and 27, 1905. Herewith follows the interesting program: "Accidental Rupture of the Uterus," by Dr. George W. Jarman, of New York; "Rertoversio Uteri—A New Operation for Radical Cure," by Dr. Arthur W. Johnstone, of Cincinnati; "A New Plan of Procedure in Retro-Uterine Displacements," by Dr. E. E. Montgomery, of Philadelphia; "Arteriosclerosis of the Uterus as a Factor in Uterine Hemorrhage," by Dr. Palmer Findley, of Chicago; "Post-Operative Vomiting," by Dr. Eugene Boise, of Grand Rapids;; "Uniformity in Pelvic and Cranial Measurements." Report of Committee, Drs. King, Williams and Davis; Symposium: "The Relation of the Appendix to Pelvic Disease or to Pregnancy;" (*a*) Relation to Pelvic Disease, by Dr. Reuben Peterson, of Ann Arbor; (*b*) Relation to Pelvic Disease, by Dr. Hunter Robb, of Cleveland; (*c*) Relation to Pregnancy, by Dr. Henry C. Coe, of New York; (*d*) Relation to Pregnancy, by Dr. A. Lapthorne Smith, of Montreal; (*e*) Relation to Pregnancy, by Dr. J. Clarence Webster, of Chicago; "Overlapping of the Fasciæ in Closure of Wounds of the Abdominal Wall," by Dr. Charles P. Noble, of Philadelphia; Symposium: "The Radical Abdominal Operation versus the Vaginal Operation for Carcinoma of the Uterus;" (*a*) The Vaginal Operation, by Dr. Carlton C. Frederick, of Buffalo; (*b*) The Vaginal Operation, by Dr. George Gellhorn, of St. Louis; (*c*) The Vaginal Operation, by Dr. Fernand Henrotin, of Chicago; "The President's Address," by Dr. Emelius C. Dudley, of Chicago; "The Mortality in Operations for Fibroid Tumors of the Uterus," by Dr. J. Montgomery Baldy, of Philadelphia; "Migratory Uterine Fibroids," by Dr. Reuben Peterson, of Ann Arbor; Symposium: "The Toxemias of Pregnancy;" (*a*) Clinical Types of Pregnancy Toxemia, by Dr. J. Clifton Edgar, of New York; (*b*) Renal Insufficiency, by Dr. Henry C. Coe, of New York; (*c*) Pernicious Vomiting of Pregnacy, by Dr. J. Whitridge, of Baltimore; (*d*) Eclampsia and Its Treatment, by Dr. Cyrus A. Kirkley, of Toledo; (*e*) The Treatment of Eclampsia, by Dr. Franklin Spilman Newell, of Boston; (*f*) Vaginal Cæsarean Section in Cases of Eclampsia, by Dr. Henry D. Fry, of Washington; "The Mortality of Operations, other than Strumectomy, in Cases of Exophthalmic Goitre, with Special Reference to Gynecological Operations," by Dr. Barton Cooke Hirst, of Philadelphia; "Sudden Death During or Immediately After the Termination of Pregnancy or Operation on the Pelvic Organs of Women," by Dr. Edward P. Davis, of Philadelphia; "The Technic of an Operation for Large Rectocele," by Dr. George H. Noble, of Atlanta; "The Surgical Treatment of Ulcer of the Stomach," by Dr. William H. Wathen, of Louisville; "The Present Status of Electricity as a Therapeutic Agent in Gynecology," by Dr. Chauncey D. Palmer, of Cincinnati; "The Third Ovary," by Dr. W. P. Manton, of Detroit; "The Repair of Injuries to the Ureter," by Dr. Florian Krug, of New York.

OBITUARY.

Dr. FREDERICK A. BATES, who lived at No. 45 West Thirty-fourth Street, New York, died Sunday last, after a lingering illness, in the home of his parents, at Catonsville, Md. He was thirty-six years old and is survived by a widow. Dr. Bates was the author of several books on ocular refraction. He was also a contributor to the *Ocular Journal*. He was born in Baltimore, Md., but had practised in New York for about fourteen years.

Dr. ERNST J. LOWENTHAL, a retired physician, died on Sunday night at the home of his son-in-law, Dr. James H. Rosenkranz, 826 Hudson Street, Hoboken, N. J., in his ninety-second year. He was born near Würzburg, Germany, and finished his medical studies there. He took part in the German and Austrian revolutionary movement in 1848 and came to America in 1850. Dr. Lowenthal was one of the founders of the Republican party and was a candidate for presidential elector on the Fremont ticket in 1855. He was a personal friend of Carl Schurz. He served as president of the Hoboken (German) Academy and for many years gave lectures in that institution. He lived half a century in Hoboken and retired from the practice of medicine twenty years ago.

Dr. ALEXANDER W. ROGERS, the oldest alumnus of the College of Physicians and Surgeons in New York, died May 14 at his home, Broadway and Lake Street, Paterson, N. J. He was born in Armagh, Ireland, December 23, 1814, and came to this country with his father, a Baptist clergyman, and settled in Pemberton, N. J. He immediately took up the study of medicine and was graduated in 1836. He was recognized as the foremost physician of Paterson. Half a century ago he ran for Mayor on the Prohibition ticket. It is estimated that he attended at the births of 5,000 children, in many cases having attended families for three generations. Dr. Rogers was a Baptist, inheriting a strong religious feeling from his father. For many years he was connected with the First and Fourth Baptist churches, Paterson. He maintained at his own expense a missionary in India. The India "Alexander W. Rogers Memorial Church" was named after him. He also built a small Baptist chapel in Paris after one of his many visits to Europe, the last of which was taken only nine months ago. Dr. Rogers was one of the original members of the Passaic County District Medical Society. He was chief of staff for many years of Paterson General Hospital. His wife died in 1893, aged seventy-nine years.

CORRESPONDENCE.

LATUREN VS. BOLTON DRUG COMPANY.

To the Editor of the MEDICAL NEWS:

DEAR SIR: As soon as convenient after the receipt of your note of inquiry concerning the further progress of the case of "Laturen *vs.* The Bolton Drug Company," I called at the residence of the plaintiff and inquired of her whether she had recently received any information about the matter. As her knowledge on the subject seemed rather vague and indefinite, and as she evidently knew nothing beyond the mere fact that the matter had been "held up" as she expressed it, I communicated with Mr. Edmund F. Driggs, her attorney, whose office is situated at No. 16 Court Street, this Borough, asking him what had become of the case. Mr. Driggs informed me that he has, for many months, been endeavoring to obtain the order of settlement on the proposed case on appeal, and that although he has repeatedly called the attention of Mr. Justice Gaynor to the matter, his efforts have been fruitless, and that consequently no further progress in the case has been possible.

It will be remembered that the case at bar is an action for damages alleged to have been sustained by the plaintiff, Mrs. Laturen, in consequence of the alleged wrongful act of the defendant Drug Company in substituting drugs in the preparation of a physician's prescription, which the defendant Company dispensed for her, and, in consequence of which alleged wrongful act, she became sick and suffered from opium poisoning.

The case was brought on for trial before the Hon. William J. Gaynor and a jury, in the courthouse, in Kings County on Tuesday, April 19, 1904, over a year ago, and it is now about two years since the beginning of the action. It will also be remembered that the learned justice dismissed the complaint.

All the facts and circumstances connected with the alleged drug substitution, together with an account of the proceedings at the trial, were set forth by your correspondent in a previous article.[1] I am informed by Mr. Driggs that an appeal was immediately taken, the proposed case being submitted to the trial justice through his secretary on or about August 14, 1904; that after waiting three months, namely, until November 14, 1904, for the learned justice to make an order of settlement, Mr. Driggs addressed his Honor concerning the matter in the following communication:

"DEAR JUDGE GAYNOR: Will you permit me to call your attention to the matter of Laturen *vs.* The Bolton Drug Company? The proposed case on appeal with amendments (all but one of which were confessed) was given to your secretary about the 14th of August, and the special term index does not as yet show any decision. I thought it possible that the papers might have escaped your attention.

"Very respectfully,
"E. F. DRIGGS.

"November 14, 1904."

To which his Honor replied as follows:

"You must be in error about August 14. My secretary was away all of August. The case was sent to me at St. James about October 1. It will be attended to in due course.

"W. J. G.

"New City, November 16."

After a further delay of a month and a half, namely, on December 31, 1904, Mr. Driggs received by mail the following communication directing him to submit a brief, which order was at once complied with:

"Laturen *vs.* The Bolton Drug Company.
"Supreme Court of the State of New York.

"EDMUND F. DRIGGS, Esq.,
"16 Court St., Brooklyn.

"DEAR SIR: Judge Gaynor directs me to say that on the motion on the minutes for a new trial in the above case, he desires a brief from you on January 9, at the opening of the Court, on the question whether the testimony on the amount of the dose in the respect of whether it was dangerous, presents a question of fact rather than of law.

"Yours truly,
"J. P. KOHLER, Secretary.

"Brooklyn, N. Y., December 31, 1904."

On the sixth day of April, 1905, namely, four months after the receipt of the above communication, Mr. Driggs ventured again to address the learned justice on the subject as follows:

"Hon. WILLIAM J. GAYNOR,
"County Court House.

"DEAR JUDGE: Will you permit me once more to call your attention to the proposed case on appeal of Laturen *vs.* The Bolton Drug Company, presented to you for passing on *one* amendment several months ago? The reason I write is that we are very desirous of having this appeal before summer adjournment.

"Yours respectfully,
"EDMUND F. DRIGGS.

"April 6, 1905."

To which Judge Gaynor replied:

"MY DEAR MR. DRIGGS: I should have decided the case before this, but got blocked with work at the equity and motion terms which I held, one following the other, which is not usual. I do not wonder you mark the delay. I am over here at Flushing holding the Queens County Term, but will take up your case the soonest possible.

"W. J. G."

Since the receipt of this communication Mr. Driggs has heard nothing further.

As this case is one which involves a question of considerable interest to the entire medical profession, and also because of its apparent importance to the entire community, it is to be regretted that so great a delay in a final adjudication of it should obtain. The time usually consumed by Mr. Justice Gaynor in disposing of the day calendar stands out prominently in contrast to his delayed action in this case. Certainly the rights of a litigant cannot be said to receive proper consideration when rapidity of action at trial term necessitates resort to appeal which, for some unaccountable reason, cannot get beyond the trial justice.

The judicial departments of various governments, and the law's delays, have ever been made the subject of criticism by observers who have, one way or another, dealt with sociological questions affecting the government of the masses. The writer of fiction, the philosopher, the poet and the scientist, have each in their turn paid their respects to the maladministration of justice. From the expeditious, but barbaric trial by combat, to the "high Court of Chancery" of England is an interesting and instructive period in the history of our jurisprudence.

A casual glance at this history will convince the reader that Judge Gaynor's delayed action in his dealing with the proposed case on appeal of "Laturen *vs.* The Bolton Drug Company" is not entirely unprecedented in the law. The celebrated case of "Jarndyce and Jarndyce" might be cited as a controlling authority. It must be admitted, in all fairness, however, that the cases are somewhat dissimilar in that "Jarndyce and Jarndyce" never, I believe, reached that dignified legal position which would entitle it to be called a "proposed case on appeal," but its quiet slumberings in the "high Court of Chancery" mark it as competent authority worthy to be cited as bearing strongly on the case at bar. Dickens regarded it as being one of the most important cases occupying the attention of this learned tribunal which he described in the following language:

"This is the Court of Chancery," says Dickens, in "Bleak House," "which has its decaying homes and its blighted land in every shire; which has its worn-out lunatic in every madhouse, and its dead in every churchyard; which has its ruined suitor with his slipshod heels and threadbare dress, borrowing and begging through the road of every man's acquaintance; which gives to moneyed might the means abundantly of wearying out the right; which so exhausts finances, patience, courage, hope; so overthrows the brain and breaks the heart that there is not an honorable man among its practitioners who would not give—who does not often give—the warning, 'Suffer any wrong that can be done you rather than come here.'"

How far removed is the litigant of twentieth century civilization from the unjust and farcical conditions accompanying legal procedure in the days of "Jarndyce and Jarndyce" if the time consumed in obtaining the court's order of settlement in a simple case on appeal shall be more than one year from the termination of the trial of the cause? When to this suggestion is added the fact that unlimited *further* delay in the granting of such an order may depend entirely upon judicial caprice,

[1] See MEDICAL NEWS, May 28, 1904, p. 1040.

the litigant may indeed hope in vain for an end to the controversy in which he has been forced to engage.

The *final* disposition of legal controversies which our courts are called upon to adjudicate, and especially those controversies dealing with questions involving underlying principles of large breadth and scope must, of necessity, be made by the courts of last resort for the reason that the average trial justice holding court in our large, crowded communities, is frequently overwhelmed with the business of the hour, with the result that questions of vast importance are sometimes overlooked, slighted, or misunderstood. The interests of justice, therefore, should prohibit unwarranted delay in the progress of the cause toward the Appellate Tribunal, and any system of procedure which tolerates such delay must become the subject of severe comment.

"There is no part of the law on which what may be called the success of the whole legal system more obviously depends, than that part which is concerned with the administration of justice, or, in the largest sense of the expression, on 'Laws of Procedure.'" "The object of this part of the law is to secure that the most expeditious and convenient remedy is accorded in the case of the actual or threatened violation of rights. The essence of a right is that the State will lend its aid in the case of need to maintain and enforce it. If the State is tardy in lending its aid, or if the conditions of accepting that aid are onerous or expensive, or if the machinery for supplying the aid is unreliable in its movements, to that extent, the rights conceded by the State are worthless and the law which affects to create and protect them is abrogated. It must, then, be the care of the State to ensure that the rights and duties which it originates are clearly ascertained; and, in case of controversy as to their existence or extent, that the persons immediately concerned may, with as little a loss as possible to themselves further than is caused by their own acts or defaults, have a ready opportunity afforded them of clearing up doubt."

Thus does the author of the foregoing lines, when dealing with the law of civil procedure, make the duties of the State to its subject perfectly clear. But, alas, what obtains in the practical application of the law to the average litigant who is not possessed of large means?

Mr. Herbert Spencer, in an essay on "The Duties of the State," makes use of the following interesting language:

"Our system of jurisprudence takes a very one-sided view of the reciprocal claims of State and subject. It is stringent enough in enforcing the claim of the State against the subject; but as to the correlative claim of the subject against the State it is comparatively careless. That it recognizes the title of the tax-payers to protection is true; but it is also true that it does this but partially. From certain infringements of rights classed as criminal, it is ready to defend every complainant; but, against others not so classed, it leaves every one to defend himself. The most trifling injury, if inflicted in a specified manner, is cognizable by the magistrate, and, redress may be obtained for nothing; but if otherwise inflicted, the injury, no matter how serious, must be passively borne, unless the sufferer has plenty of money and a sufficiency of daring."

"That men should sit as apathetically as they do under the present corrupt administration of justice is not a little remarkable. It is not as though the facts were disputed; all men are agreed upon them. The dangers of law are proverbial. The names of its officers are used as synonyms for trickery and greediness. The decisions of its courts are typical of chance. In all companies you hear but one opinion, and each person confirms it by a fresh illustration. Now you are informed of 300 pounds having been expended in the recovery of 40 shillings' worth of property; and again, of a case that was lost because an affirmation could not be received in place of an oath. The right-handed neighbor can tell you of a judge who allowed an indictment to be objected to, on the plea that the words "In the year of our Lord" were not inserted before the date, and another, to your left, narrates how a thief tried for stealing a guinea-pig was acquitted because a guinea-pig was shown to be a kind of rat, and a rat could not be property."

"At one moment the story is of a man whose rich enemy has deliberately ruined him by tempting him into litigation, and at the next it is of a child who has been kept in prison for six weeks in default of sureties for her appearance as witness against one who had assaulted her. This gentleman has been cheated out of half his property, but dared not attempt to recover it for fear of losing more; while his less prudent companion can parallel the experience of him who said that he had only twice been on the verge of ruin—once when he had lost a law-suit, and once when he had gained one."

"In Civil Cases," says Spencer, "the ruling agency cares scarcely more than of old about rectifying the wrongs of the injured; but, practically, its deputy does little else than enforce the rules of the fight, the result being less a question of equity than a question of pecuniary ability and forensic skill. Nay, so little concern for the administration of justice is shown by the ruling agency, that when, by legal conflict carried on in the presence of its deputy, the combatants have been pecuniarily bled, even to the extent of producing prostration, and when an appeal being made by one of them the decision is reversed, the beaten combatant is made to pay for the blunders of the deputy, or, of a preceding deputy; and not unfrequently the wronged man who sought protection or restitution is taken out of Court pecuniarily dead."

Again, we find Prof. Ernst Haeckel expressing his opinion regarding the comparative advancement of legal science with the present state of civilization: "While we look back with a just pride on the immense progress of the nineteenth century in knowledge of nature, and in its practical application, we find, unfortunately, a very different and far from agreeable picture when we turn to another and not less important province of modern life."

"To our great regret we must endorse the words of Alfred Wallace." "Compared with our astounding progress in physical science and its practical application, our system of government, of administrative justice, and of national education, and our entire social and moral organization, remain in a state of barbarism."

"To convince ourselves of the truth of this grave indictment we need only cast an unprejudiced glance at our public life or look into the mirror that is daily offered to us by the press, the organ of public sentiment."

"We begin our review with justice, the *fundamentum regnorum*. No one can maintain that its condition today is in harmony with our advanced knowledge of men and the world. Not a week passes in which we do not read of judicial decisions over which every thoughtful man shakes his head in despair. Many of the decisions of our higher and lower courts are simply unintelligible."

The loudest protestations of the ordinary citizen against the abuse of judicial power are feeble murmurs when compared to the thunderings of such great minds as those of Spencer and Haeckel, one speaking as he does for the reform of a corrupt system of jurisprudence which he asserts is commonly practised among his countrymen, the other lifting up his voice for liberty

and justice among the poor of the German Empire. Nevertheless, the listening ear can everywhere detect the constant murmurings of the compact majority.

Dickens' graphic picture of the English system of justice as it was administered in the high Court of Chancery is by no means exaggerated. Suits in chancery were dragged along for periods of time ranging from ten to fifty years, and even longer. Undecided cases were still pending when Dickens wrote "Bleak House," namely, in 1853, which had been in the meshes of the law since the previous century, and in which thousands of pounds sterling had been swallowed up in costs.

The law of heredity manifests itself in the lives of nations as well as in the tendencies of the individual. Diseased ramifications extend through and through our systems of government, and, like the inherited taint in the individual, are difficult to root out. The element in our judicial system which permits of the delay of procedure which has been demonstrated to exist in the case of "Laturen *vs.* The Bolton Drug Company," is a relic of the injustice of the high Court of Chancery of England, and should, in these days of advanced thought, have long since become a thing of the past.

According to Judge Gaynor's own account of the affair, the proposed case on appeal has been in his hands awaiting his order of settlement for more than seven months. Such unreasonable delay in the administration of justice may be truthfully said to result in great hardship to the litigant, and may be the means of depriving him of the right of final decision.

It must persuade him that there is something radically wrong with that branch of a system of judicial government which inflicts upon its subject a penalty for justly entering within its portals—the penalty of unwarranted delay in the final adjudication of a just claim. Moreover, as in the present instance, the case to be submitted to the Appellate Court for its consideration may be one which involves a question of vital importance to the entire community.

The dismissal of the complaint in the action at bar was a shock to the medical profession, because of the fact that the decision of the learned trial justice distinctly upheld the right of the druggist to substitute, at his will or convenience, the ingredients called for in the physician's prescription. A decision of this character handed down from one of the *lower courts* would certainly be unique, and against all public policy and sentiment, but, coming as it does from the Supreme Court of this State, the Court of highest jurisdiction, it is far-reaching and should be submitted to the Court of last resort without the hindrance of capricious delay.

Very truly yours,

WILLIAM J. CRUIKSHANK.

102 Fort Greene Place, Brooklyn, N. Y. May 9, 1905.

P. S.—Since the above communication was written, namely, on Monday, May 15, a decision, denying the motion for a new trial, was handed down by the learned trial justice, who also wrote a lengthy opinion devoted to the merits of the case. An examination of this opinion reveals the fact, that, with the exception of its verbosity, it does not differ from the opinion which his honor delivered in dismissing the complaint. It clearly maintains the authority of the druggist to alter the physician's prescription, and it holds further that, in the case at bar, the druggist—having added morphine acetate to the mixture which he dispensed for the plaintiff, when none was prescribed for her, acted in a proper manner and without negligence. This recent detailed opinion, coming, as it does, from the Supreme Court, impresses me, at present, as being of sufficient interest to the medical profession to require the possibility of further consideration, and I may, perhaps, feel the necessity of referring to it at greater length in a future communication.

W. J. C.

May 16, 1905.

ASSOCIATION OF AMERICAN PHYSICIANS.

Twentieth Annual Meeting, held at Washington, D. C., May 16 and 17, 1905.

FIRST DAY—MAY 16TH.

Presidential Address.—The regular business of the twentieth annual session of this association began with the reading of the Presidential Address on the occasion of his retirement, by Dr. E. L. Trudeau, of Saranac Lake, N. Y.

Scientific Character of Meetings.—Dr. Trudeau said that the characteristic feature of the meetings of the Association of American Physicians is the absence of any indulgence in personalties. The sessions are noted for their scientific medical interest in the broadest sense of the term. The Association has always been recognized as the medium between the clinician and the laboratory worker. This reputation has been maintained so well for the twenty years of its existence that now there can be no fear that the future will see any serious change in this matter. Undoubtedly the increase in the membership by twenty-five, which became part of the by-laws last year, and the creation of the class of associate members which is to be voted on at the present session will still further add to the interest with which the proceedings of the Association of the American Physicians have always been looked to by the profession of the country.

This Year's Losses.—Dr. Trudeau called attention to the death of Dr. Lyman, who had been, since the beginning, a prominent member of the Association. Two other serious losses must also be chronicled, fortunately not by death but by calls to positions of higher influence for the members concerned. Prof. Cushny, the Professor of Pharmacology, of the University of Ann Arbor, Mich., goes to London to continue his fruitful labors. Prof. William Osler, of Johns Hopkins, accepts the post of Regius Professor of Medicine of the University of Oxford, and thus creates a distinct lacuna in the membership of the Association. Dr. Osler's teaching abilities have been exerted not only in the narrow sphere of the different universities where he worked but on all the profession of the country. Even his seniors in professional work felt the influence of his suggestive habit of mind and of his investigating spirit. His is a loss that may not be too deeply deplored since it is others' gain, but will be felt for many years and cannot well be made up for.

The Fear of Cats.—Dr. S. Weir Mitchell, of Philadelphia, read a paper in which he described the dread of cats which overcomes some people, and the curious power which so many of these people have to recognize the presence of these animals even when they cannot be seen or heard. Three years ago a patient was sent to Dr. Mitchell, the main feature of whose nervous condition was intense fear of cats. She insisted that she was able constantly to tell when a cat was in the room. At first it seemed as though this claim might be exaggerated. On investigation, however, it seemed that there might be some ground as to her ability to recognize the presence of cats. Later another case came under observation and then Dr. Mitchell set about investigating the status of this mental peculiarity. It is,

of course, very different from the asthma which occurs in certain animals or the result of the odors of horses. dogs, cats, sheep and the like. In the course of his study a number of these latter cases, however, were called to his attention showing how common is this affection.

Replies to Questions.—Dr. Mitchell published in *American Medicine*, a series of questions asking information in regard to this morbid cat dread. He received 159 replies, some of them from Germany, some from Egypt, and India, and many of them from the more intelligent classes, from university professors, from army officers and the like. One-third of the replies did not refer to the condition under Dr. Mitchell's consideration. Many of them referred to cat asthma which is not often accompanied by dread or dislike of cats. Usually, this is due to the odor occasioning the asthma. Similarly there is the asthma from roses, apples, oranges and bananas, a number of examples of which have come under Dr. Mitchell's observation.

Cat-Phobia.—This is a fear that comes, instantaneously reaching its maximum at once. Asthma is a cumulative effect. The influence, however, may be extremely severe. In one case that was reported, for instance, even a condition of catalepsy developed. In another, temporary blindness was noticed. Usually the phobia passes off with the going of the cat, but leaves a sense of intense fatigue and dispiritedness. Sometimes the patients dream of cats and one of them has spoken of this not inappropriately as cat-mares. The dread is not always confined to women, nor are the men affected by it only of the timorous kind. One army officer who had hunted large cats—the lion and the tiger—very frequently without any fear, could not stand the domestic cat and would not pass one of them on the street if he could possibly help it.

Origin of the Condition.—Some attribute the origin of their dread of cats to a scare from a cat in childhood, others can find absolutely no reason. In about one-fourth of the cases it is noted as a family peculiarity. Five out of seven in one family suffered from it in a greater or less degree. In certain families it occurs among the ancestors rather frequently. Brothers and sisters frequently suffer from it in the same family. Sex seems to have no influence but women suffer from the affection worse than men. Many distinguished persons are known as having been afraid of cats. There is a tradition that Washington had an aversion to these animals, but there is no definite evidence in the matter. As to the direct cause, it seems to be in certain cases some emanation from the animal. Thirty-one persons could tell when a cat was near, though it had not been seen or heard. A certain number of these could tell if a stray uncared for cat had come into the house, though well-groomed cats from the neighborhood were less easily detected.

Odors in the Etiology.—At times the patients are not aware of any special odor, but then those who suffer from asthma frequently have no sense of the odor which occasions their affection. In some cases woolens on which the animals have lain are enough to produce the effect. Most of those who suffer from cat-phobia insist that they do not smell the animals. The sense of smell is, however, the one about whose physiology we know the least. Some people have it developed to a marvelous degree. The case of Laura Bridgeman who distinguishes persons by their odors is well known. Dr. Mitchell has had under observation a lad who could pick out the handkerchiefs of different relatives after they had come back from the wash. Some people are able to recognize the gloves of relatives in the same way. Just as there are sounds beyond the range of our hearing and waves in the ether which are not light or heat for our senses, so there may be peculiarities of the underlying basis of smell that correspond to these physical phenomena.

Other Results.—Cat-phobia may not be due to anything resembling odor however distantly. It must not be forgotten that some persons suffer from acute conjunctivitis whenever they come near a cat. Others have various skin manifestations, erythemas, etc., because of the propinquity of the cat. These manifestations are evidently not due to anything resembling odor or that might be felt in the nose. In a word, this whole subject well deserves investigation, since it enters on so many fields of science where little is known.

Intrapleural Lipoma.—Dr. Reginald Fitz, of Boston, described a case in which pneumonia was complicated by the presence of a large interpleural lipoma. He said that subpleural fat is not uncommon in obese persons. It has attracted attention for several generations. Sometimes this exists to the extent of forming lipomata. Occasionally they found their way through the chest wall and projected beneath the skin. When surgical removal was attempted in these cases a pedicle was found leading into the interior of the chest. In attempting to remove this surgeons usually made a mistake. The wound became infected and all except one of the patients perished. In the last case operated upon the tumor was not followed into the thoracic cavity and the patient recovered.

Pneumonia With Delayed Resolution.—The patient was a physician suffering from pneumonia in the left upper lobe. There was delayed resolution and an attempt was made to discover the cause. The heart sounds were very faint and pericarditis was suspected, though no increase of dulness could be found. An exploratory puncture was made in the fifth interspace close to the sternum. It proved negative. Puncture was then made in the fourth interspace two inches out from the sternum, but this also was negative. Thinking that there might be fluid in the pleural cavity, puncture was made in the eighth interspace, but this also proved negative. The patient became weaker and finally succumbed. After his death Dr. Fitz suggested the insertion of an exploring needle through the xiphoid costal angle. Through this a pint of pus flowed. The autopsy revealed the presence of a lipoma as large as a baby's head, springing from the mediastinal space. This is the first instance in which a lipoma has been reported as pushing the heart out of the way in such a fashion as to interfere with the diagnosis of the treatment of pericarditis.

Puncture in the Xiphoid Costal Angle.—A number of excellent clinicians have suggested making the puncture for pericarditis through the angle made by the sternum and the ribs close up to the bones. Baron Larry suggested the drainage of the pericardium at this point and treated a soldier successfully over a hundred years ago. It has been objected that drainage is more dangerous through here than in other parts because of the danger of infection. It is also said that the liver and the diaphragm are more liable to injury. As a matter of fact, however, there would seem to be less danger here.

Large Lipoma.—Dr. James Ewing, of New York, presented a specimen which had been found in the dissecting room. This consisted of a very large lipoma, though it occurred in a moderately fatty individual of middle age. It showed a distinct tendency to infiltrate the pericardium and ran along the vessels of the neck and aorta and the diaphragm. The left lung was compressed, but still had a certain amount of air in it and the condition had evidently never been suspected at all.

Pericardial Puncture.—Dr. Osler said that the point for puncturing the pericardium preferable to others was in the left angle of the sternocostal junction. In a series of cases studied by him in the Philadelphia Hospital post-mortem, he had found that in all cases the needle readily penetrated the pericardial sac if inserted high up. In a case of tuberculous pericarditis several tappings had been made in other parts with the result of obtaining a small amount of effusion. When the puncture was made here, however, a large amount of effusion was obtained. As the diaphragm is depressed by the pathological condition in the pericardium it is not likely to be injured. If any reasonable amount of care be observed the liver will not be injured.

Necessity for Frequent Tapping.—Dr. Osler said that in looking over the records of his fatal cases of pneumonia recently he has been struck with the frequency with which patients die during the course of pneumonia with large effusions into their pericardial sacs. It would seem then that the pericardium sacs could be tapped more frequently or even freely incised in some cases. The diagnosis of the presence of a pericardial effusion can be recognized by means of a hyperodermic needle. Some have an inordinate fear of wounding the heart. There is, however, no real danger from puncture of the ventricle near the apex. Indeed cardiocentesis is rather a stimulant and especially in certain forms of pneumonia, if it did occur, would do more good than harm. An advance in practice will evidently come along these lines so that physicians will not hesitate to use the needle more freely than has hitherto been the custom. Dr. Francis Williams, of Boston, said that X-ray examinations with the fluoroscope enabled the diagnosis of effusion of the pericardium sac to be made with more exactness than any other known method. At the same time the form of the sac could be determined in this way and the most suitable place for tapping determined upon.

Dr. W. P. Northrup, of New York, said that once in doing a tapping of the pericardium the needle used evidently penetrated the heart muscles, for it began to move with the heart beats. It proved, however, as Dr. Osler had suggested, a stimulant instead of a depressant of the heart's action.

Dr. Forchheimer, of Cincinnati, said that tapping of the pericardial sac in children had not been advisable in his experience, and he had seen at least one fatal result, that seemed to be attributable to an ill-advised tapping of the pericardium.

Dr. Northrup explained that his case was not that of a child but that of a longshoreman and he fully agrees with Dr. Forchheimer as to the advisability of not doing pericardial tapping in children as a rule.

Dr. Peabody, of New York, said that in many cases of pericarditis the exudate is thick and of fibrinous character and would not find its way through a small hypodermic needle. Undoubtedly many pneumonias are complicated by pericardial effusion, but most of them give no symptom and so it would be hard to decide in which cases tapping was needed.

The Incision of Pericardium.—Dr. Fitz said, in closing the discussion, that at times the effusion in the pericardial sac is walled off in such a way that it cannot be reached by any ordinary tapping. In these cases if symptoms are severe and seem to indicate the presence of fluid in the pericardium, then incision should be made and drainage instituted. Relief and recovery follows in what are otherwise hopeless cases. With regard to diagnosis, not too much dependence must be placed on negative tapping. Undoubtedly tapping at the xiphoid costal angle will disclose the presence of pus in more cases than at any other point.

Rhythmic Lateral Displacement of the Heart.—Dr. Chas. Lyman Greene, of St. Paul, Minn., said that in 1902 he called attention to a hitherto unobserved sign of unilateral pleuritic exudate, consisting of a rhythmic lateral displacement of the heart, synchronous with respiration. Extended observation during the past three years confirms the original observations and shows that the sign is of value in differential diagnosis. A number of cases are quoted in support of the foregoing statement, a large number representing other conditions having failed to show rhythmic lateral displacement. It was absent in subdiaphragmatic abscess, malignant disease of the lung and pleura, and in pneumorthorax. The sign is best observed by the fluoroscope or by auscultatory percussion. The degree of effusion markedly influences the movement, trifling effusion failing to show it, massive effusion being accompanied by a minimum of rhythmic displacement. The sign is sometimes obtained by inspection, but such observation is subject to error. It is more easily recognized in right than in left-sided effusion. Deep respiration is necessary and may require the exhibition of morphine for the relief of the attendant pain. The author doubts the statement generally accepted that in certain cases of effusions the diaphragm is rendered immovable or bulges into the abdominal cavity, no such condition having been observed. He also takes issue of the statement that the extent of cardiac displacement in liquid effusion can be accurately determined without the use of the fluoroscope, auscultatory percussion in cases of displacement to the left and simple percussion having yielded outlines corresponding accurately to fluoroscope findings.

Sign of Unilateral Pleurisy.—In a résumé of the probable causes of rhythmic lateral displacement he takes the ground that in the presence of unilateral exudates of considerable quantity such movement is inevitable on the basis of purely physical causes, the anatomical structure and physiological mechanism of the thorax and its contained organs. His conclusions are: (*a*) A rhythmic lateral movement of the heart occurs in unilateral liquid pleural effusions. (*b*) Such movement is most marked in medium-sized effusions. (*c*) The heart approaches the affected side in inspiration and moves outward in expiration. (*d*) The extent of movement is variable, but often amounts to two inches. (*e*) That it may be measured by fluoroscopic examination, auscultatory percussion, or in the case of right-sided effusions by simple deep percussion of the free cardiac border, or in some instances by mere inspection of the apex beat. (*f*) Deep breathing and especially forced expiration are essential to the success of the maneuver, and, to obtain this, morphine must

sometimes be administered. (g) Marked rhythmic lateral movement has not been found in pneumonia, tuberculosis infiltrations of the lung, malignant disease of the pleura or lung, or in subdiaphragmatic abscess.

Gonorrheal Septicemia.—Dr. William S. Thayer, of Baltimore, said that gonorrheal septicemia may occur without any other complication. Continued fevers as the result of the gonococcus, some with arthritis and some without, are not at all infrequent. They resemble typhoid fever in their course, or malaria, and undoubtedly have been mistaken for these diseases in the past. Dr. Thayer reported a case in which fever continued for seven weeks, and from the blood of which pure cultures of the gonococcus were obtained, yet complete recovery took place. Altogether ten cases of endocarditis due to gonorrhea have been reported at Johns Hopkins Hospital. In six of these the blood culture was positive and in four of them these organisms were found in the blood during life.

Frequency of Gonorrheal Endocarditis.—In six years Dr. Thayer has seen five cases of ulcerative endocarditis in private practice which have all followed gonorrhea. This affection, then, is not so infrequent as has sometimes been thought. It usually runs its course with a remittent and intermittent fever and with chills, and may readily be mistaken for some other infection. In both of the cases in which gonorrheal affections of the aortic valves were found, the physical signs all pointed rather to an affection of the mitral valves. There was a presystolic mitral murmur and accentuation of the second pulmonic sound which seemed to indicate beyond all doubt that the mitral valves were involved.

Simulation of Typhoid.—In a case recently seen this similarity was so marked that it would have been impossible by any ordinary means to have differentiated the two affections. The fever continued for six weeks. It began with aches and general pains and presented a coated tongue and some spots on the skin almost resembling characteristic rose spots. On the twenty-first day, when it had been about decided that the case must be one of typhoid fever, the gonococcus was found in pure culture in the blood.

Dr. Osler said, in discussing Dr. Thayer's paper, that while the milder cases of gonorrhea septicemia resembled typhoid so much as to make the recognition almost impossible, if you examine the chart of these cases they will surely seem to be typhoid. There is, however, beside this mild form of the disease a severe acute fulminate septicemia which may carry the patient off in a few days. In a case of this kind recently under Dr. Osler's observation no endocarditis was present, and the only localized condition found was a small pocket of pus in one lobe of the prostate.

Dr. Thayer, in closing the discussion, said that in his cases there was no evidence of involvement of the joints and no local symptoms in any other part of the body.

Fever in Chronic Endocarditis.—Dr. J. S. Thatcher, of New York, analyzed the histories of over 1,000 patients suffering from chronic endocarditis at the Presbyterian Hospital in New York. In about one-half of all these cases fever was present. In one-half of the cases in which fever was present some definite reason could be found for the presence of the fever. In nearly 500 cases, however, fever was present without any definite reason except the endocarditis itself. The mortality of the afebrile was 19 per cent.; in the rheumatic febrile cases it was seven per cent. Where other complications existed causing fever the mortality was about 35 per cent. In cases with fever, but without any complications causing the fever, the mortality was about the same.

Presence and Absence of Murmurs.—Dr. W. Gilman Thompson, of New York, asked whether the chronic endocarditis was diagnosed by means of the murmur or in some other way. According to statistics of the New York Presbyterian Hospital, in about one out of seven cases in which heart murmurs are heard no endocarditis is present. In about one in seven of the cases in which endocarditis is found at autopsy no murmur was heard during life.

Dr. Aloysius O. J. Kelly said that it is not surprising to have chronic endocarditis associated with fever. There is already an inflammatory condition of the heart valves. This may run a chronic course or there may be recrudescence of the infective process. In some cases reinfections run an acute fatal course. Some of these have exuberant vegetations on the heart valves, but some of them, on the other hand, have only inconspicuous lesions. German clinicians and pathologists have spoken of chronic recurring endocarditis, and some of Dr. Thatcher's cases would undoubtedly come under this heading.

Chorea and Fever.—Dr. John K. Mitchell, of Philadelphia, said that in many cases of chorea there is a moderate fever which lasts five or six weeks and may run its course without endocarditis. In some of these cases, however, endocarditis does develop. On the other hand, there is more than a suspicion that endocarditis may run so mild a course as not to give sufficient physical signs for its recognition.

Dr. Jacobi, of New York, said that there is no murmur present unless the lesion is on the edge of the heart valves. It is perfectly possible to have rather extensive lesions then without any murmur. On the other hand, murmurs may be present when it is not endocarditis but myocarditis that is at work. This is especially true with regard to systolic mitral murmurs. As a rule, if a murmur disappears occasionally, and if it is indistinct, it is better to diagnose myocarditis than any form of endocarditis.

Dr. Tyson, of Philadelphia, said that in a certain number of petechial eruptions the febrile course is anomalous. In a case now under observation the temperature is subnormal. The eruption makes its appearance when the patient is around on her feet and does not disappear rapidly unless she is put to bed again.

Bacterial Poisons Lower Temperature.—Dr. Victor C. Vaughan, of Ann Arbor, Mich., said that all bacterial poisons, without exception, lower temperature. Tonsillitis with a temperature of 104° or 105° F. is usually not serious. Diphtheria, however, with a temperature only slightly above a hundred may be very dangerous. And diphtheria patients with subnormal temperature nearly always die. The more rapidly bacteria poisons are given off the lower is the temperature. Nature's protective reaction is fever, and if she is able to maintain a high temperature the invading bacteria are, as a rule, being successfully resisted.

Chronic Endocarditis and Continued Fever.—Dr. Osler described some cases in which chronic endocarditis was accompanietd by fever for many months. Usually the pathological condition in these cases was that of a chronic vegetative endocarditis without much erosion or ulceration of the valves. Fever dominates the clinical picture. In one case the fever lasted thirteen months, in others for four and seven months respectively. Recently he saw a physician in whom the fever lasted for seven and a half months. Years ago these cases used to be thought by every one, even authorities in medicine, to be of malarial origin.

Dr. Peabody said that he had seen some of these cases of long-continued fever associated with endocarditis, but they are not necessarily fatal. Two cases recently seen have their murmurs still but have recovered from the fever and are in excellent health.

Opium in Myocarditis.—Dr. John H. Musser, of Philadelphia, said that opium is the best drug for the incidents and accidents of heart weakness. It has no effect on the myocarditis process itself, but it supports the heart when laboring from shock, and is of decided advantage in attacks of dilatation. When a systole occurs or in attacks of angina pectoris no better drug can be found to control the frequency of the attacks. It is especially useful in chronic endocarditis in mitigating the effect of failure of circulation to the nerrvous system. The prolonged use of opium is necessary in most cases. In endocarditis with melancholia it is especially of service.

Dr. Fussell, of Philadelphia, said that while morphine is usually not considered to be a diuretic, he has seen a prompt increase of urine take place as the result of its administration.

Hemophilic Joints.—Dr. P. J. Kinnicutt, of New York, described the lesions of the joints of hemophilia. These are due to effusion into the joint of blood, but there is no discoloration on the outside to indicate this. In not a few cases these joints have been taken for tuberculous joints. Kernig operated on one with a fatal result from uncontrollable hemorrhage. In other cases only the occurrence of severe bleeding after the pulling of a tooth revealed the underlying blood dyscrasia. In a certain number of cases the joints have been thought affected by arthritis deformans. In some cases, as in one described by Dr. Kinnicutt, there may be no hereditary, hence the greater danger of mistaking these cases. There seems no doubt that some of these cases develop *de novo*. In Dr. Kinnicutt's case the condition was congenital, though the tracing of the family history through four generations showed no trace of bleeders. There was a history of diabetes, however, and both father and mother had sprung from the same stock, their ancestors in the fourth generation being brother and sister.

Neurotic Heart.—Dr. Beverly Robinson, of New York, discussed various phases of the neurotic heart and said that they were almost less understood than the serious organic lesions. Not infrequently there are vascular or muscular changes present which make differentiation very difficult. Undoubtedly the cases of slow heart are among the most difficult. Not only is their pathology obscure, but the causes of the condition are practically unknown. Dr. Robinson has found that massage with a certain amount of stimulation, especially with coca, is extremely important. Notwithstanding the fact that these patients are often anemic, iron does not produce good results and often seems to be practically inert. Undoubtedly some of the cases of nervous heart go on to dilatation and subsequent hypertrophy. At times cardiac murmurs are nervous in origin and no valvular lesion will be found post-mortem. The differentiation of the irregular features of neuroses of the heart from myocarditis is extremely difficult. The Nauheim treatment seems to be beneficial wherever the neurotic elements predominate in the case. If there is myocarditis at the same time as the neuroses, then the Nauheim treatment is especially likely to do good.

Pneumococcus Sepsis.—Dr. John S. Thacher, of New York, described an especially severe case of pneumococcus sepsis recently under his observation. The patient came into the hospital on the sixth day with a severe pneumonia, but the heart sounds perfectly clear. The case seemed to run the ordinary course of an acute lobar pneumonia of the right lower lobe. The patient had an alcoholic history, though a gentleman in all other respects. On the eleventh day he seemed to be getting better, but then there was a relapse of symptoms and on the fourteenth fluid was found in the chest and there was a rise of temperature. Only two and one-half days before death was there any murmur in the heart. Then a diastolic murmur was heard at the apex and the conclusions therefrom were confirmed at the autopsy. There was a thrill all over the blood vessels and it could be felt even in the leg, so that if the patient's calf was grasped a pounding thrill could be felt. The day before death lumbar puncture showed the presence of pneumococci in pure culture. The pleural fluid also contained these micro-organisms. The day before death pneumococci were found in the blood. Autopsy showed incomplete resolution of the pneumonia. There were no patches of actual consolidation, but there was intense congestion.

Perforation in Child's Typhoid Fever.—Dr. J. P. Crozer Griffith, of Philadelphia, reported six cases of perforation in typhoid fever in children. Perforation is said not to occur so frequently in children as in adults, but there seems no doubt that more careful diagnosis will show it to be more frequent than thought. As in other phases of typhoid fever in children the symptoms are quite different to those in adults. In most cases there is very little complaint of pain and the reaction of the organism is by no means so prompt as in adults. All of Dr. Griffiith's cases proved fatal mainly because of the inability to recognize early enough the actual condition present and consequently to have operation, though operations were refused in several of the cases. In children of ten, eleven and twelve years of age the pain is often no more than that seen in cases of typhoid fever without perforation. Often patients do not appear ill for twenty-four hours after perforation has taken place. In one case a child of eleven presented no symptoms of typhoid fever at all, being a walking case, until perforation took place, when the condition seemed to be one of gastro-enteritis. As the symptoms occurred shortly after eating a plate of ice cream this seemed to be the most likely diagnosis. The next day, however, intense pain and abdominal distention set in and then more careful investigation showed the presence of rose spots.

Dr. Jacobi, of New York, said that perforation in

typhoid fever in children often took place without any premonitory symptoms. Usually in these cases there is some diarrhea, but the perforation will take place without any warning diarrhea.

Dr. Peabody, of New York, said that perforation often takes place in adults as well as children in cases where there has been no diarrhea. Indeed, absence of diarrhea represents one of the warning signs of the possibility occurring .

Hematemesis from Gastric Ulcer.—Dr. W. Gilman Thompson, of New York, gave the details of some two hundred cases of gastric ulcer in which the principal symptom was the vomiting of blood. In one case out of four there was a fatal termination sooner or later in the history of these cases. Undoubtedly some of these patients having passed from observation have had fatal terminations so that the actual mortality from this affection is worse than has been found from the statistics as they can be gathered in hospital experience. Since the results are so bad under medical treatment it seems important that surgical treatment should be applied. Twenty of these cases were transferred from the medical division of the hospital to the surgical and operated upon. Five of them proved to be something else besides ulcer of the stomach. In one there was diffuse tuberculosis of the gastric mucosa. In one a duodenal ulcer was present. In one nothing was found, and this has been the experience in other cases that in spite of furious hemorrhage from the stomach no lesion could be found. Unfortunately some of these cases in which surgical exploration showed no lesion have proved fatal after operation, and so medical men have become discouraged.

Diagnosis and Complications.—The ordinary methods of diagnosis are by no means sure. The gastric analysis by chemical means does not furnish useful information, either as to diagnosis or prognosis. As a rule, any one chemical test of the stomach contents is of no value for diagnostic purposes. The results of a number of test meals must be compared. It is scarcely justifiable to pass the stomach tube more than once in a patient suffering from gastric ulcer from which there has been bleeding. In a certain number of cases of hemorrhage from the stomach adhesions of the stomach wall are found and most of the patient's discomfort comes from the presence of these adhesions. In two of Dr. Thompson's cases after the breaking up of the gastric adhesion, patients had no more discomfort and have lived well for several years since.

Recent Surgical Statistics.—Dr. Thompson said that the recent surgical records of operated cases of gastric ulcer are most encouraging, and especially considering the fact that medical means are so futile in the treatment of this affection. Moynihan, the English surgeon, has reported operations on one hundred and thirty cases of gastric ulcer with only two deaths. Other surgeons are reporting results almost as good. Undoubtedly more can be accomplished and with more assurance by surgical means than by any other.

Etiology of Gastric Ulcer.—A curious feature of the etiology of the disease is to be found in a comparison of the statistics of Bellevue Hospital with the Presbyterian. Of patients admitted at Bellevue only one in three thousand suffer from gastric ulcer. At the Presbyterian one in eighty of the medical cases have this affection. At Bellevue alcoholism and starvation with hard living and infection are rather the rule in patients' histories. At the Presbyterian seamstresses and house servants generally who are recommended by their mistresses are received much more generally, and these constitute the anemic cases in which gastric ulcer occurs more frequently. Males suffer from the disease not so frequently as females, but still in quite large proportion, but at a later age, as a rule.

Metal Poisoning.—One-fourth of all the cases of males in Dr. Thompson's list proved to be metal workers. No one metal seemed to have been especially favored in this matter. Some of them were workers in brass, some of them in lead, some of them typesetters, and it would almost seem that the presence of contact with metals had something to do with the occurrence of the ulcer. In a private patient, Dr. Thompson found that a severe hemorrhage, evidently due to a gastric ulcer, followed upon the taking of arsenic for many years. The patient suffered from eczema and had been advised by a physician to take arsenic. During his travels around the world he had had it constantly by him, and on his return to New York had been suddenly taken with a furious hemorrhage, which proved fatal.

Minute Ulcers.—Dr. Francis Kinnicutt, of New York City, said that it is often extremely difficult to discover the minute ulcerated spot from which a severe hemorrhage may proceed. At times even after the most careful searching it cannot be discovered. This is true even on the autopsy table, where every facility for thorough search is afforded. It can easily be understood, then, that a surgeon will find it difficult to discover such ulcers within the stomach cavity. On the other hand, often when death seems impending hemorrhages stop, patients recover and remain in good health for years. A case recently sent to the surgical ward of the Presbyterian Hospital illustrates this. Hopeless of medical treatment proving successful, it is sent to be operated upon, after having had successive hemorrhages for many days. No hemorrhage occurred in the surgical ward, and operation was put off and the patient eventually recovered without surgical intervention, and has since remained well.

Results of Elections.—The following nominees recommended for election to membership by the council were elected: Drs. A. B. MacCallum, of Toronto, David Riesman, of Philadelphia; Adolf Meyer, of New York; J. L. Miller, of Chicago; R. H. Babcock, of Chicago; Thomas McCrae, of Baltimore, and S. S. Adams, of Washington. The following nominees recommended for election to associate membership by the council were elected: Drs. J. D. Steele, of Philadelphia; Joseph Sailer, of Philadelphia; Joseph A. Capps, of Chicago; Henry Christian, of Boston; A. E. Taylor, of San Francisco; L. A. Connor, of New York, and Theodore Janeway, of New York. The following officers were elected for the ensuing year: President, Dr. Frank Billings, of Chicago; vice-president, Dr. Francis Kinnicutt, of New York; treasurer, Dr. J. Crozer Griffith, of Philadelphia; recorder, Dr. S. Solis-Cohen, of Philadelphia.

(To be Continued.)

BOOKS RECEIVED.

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